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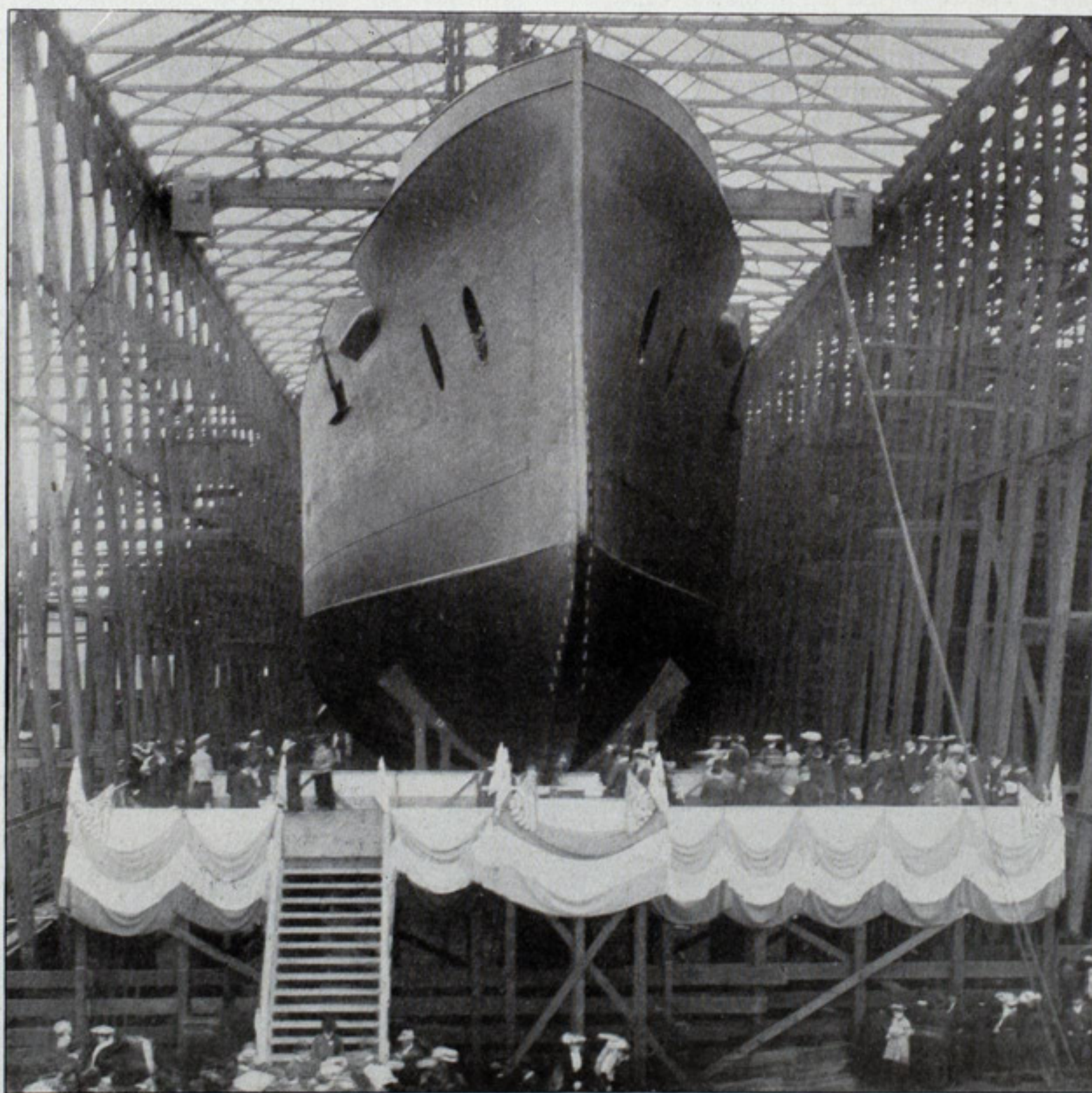
LAUNCH OF ARMORED CRUISER CALIFORNIA.

The United States armored cruiser California, building at the Union Iron Works, San Francisco, for the United States government, was successfully launched on Thursday, April 28, at 10:40 a. m., amidst the shrieking of whistles, the firing of guns and the wildest enthusiasm of the thousands of spectators. The electric button releasing the vessel was pressed by Mrs. W. S. Martin, and as the cruiser started down the ways Miss Florence Pardee, daughter of California's chief executive, christened the vessel.

Preparations for witnessing the launch had been made on an extensive scale, and in addition to the four steamers chartered for the occasion, by the Native Sons of the Golden West, who had charge of the ceremonies, every other vessel in the harbor, not in active commission, was pressed into service for carrying sightseers within view of the launching. Thousands of badges were sold by the Native Sons which admitted their bearers to the steamers chartered by the organization for the occasion.

The launching was witnessed by Gov. Pardee and his staff, Gen. McArthur and his staff, naval representatives from the Mare Island yard, officials of the national guard of the state, and the United States government inspectors superintending

the construction of the vessel at the Union Iron Works, all of whom were conveyed to the scene on the government tug Slocum, while the tug Defiance carried the general committee of the Native Sons of the Golden West. The board of education published an order closing the schools for the day, in honor of the event, and the president of the Merchants' Association and Manufacturers' & Producers' Association, the San Francisco Board of Trade and the California state board of trade, recommended the members of various organi-

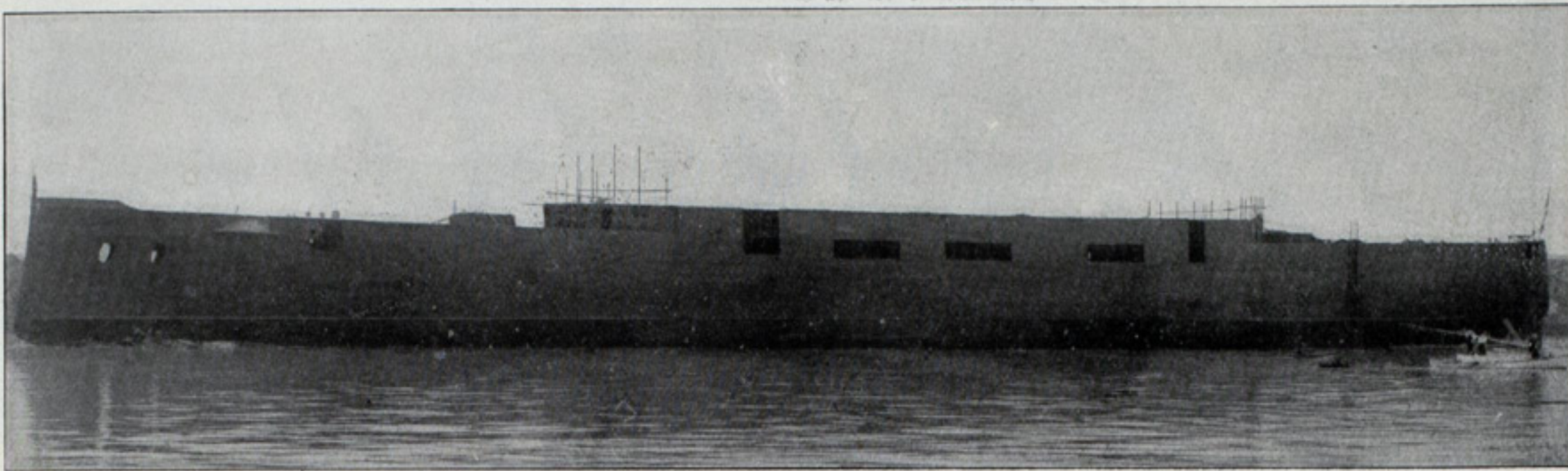


BOW VIEW OF ARMORED CRUISER CALIFORNIA ON THE STOCKS, SHOWING LAUNCHING STAND AND PARTY.

[Building by Union Iron Works, San Francisco.]

zations that all business houses be closed during the hours of the ceremony.

The California exceeds in dimensions the average battleship and has an armament but slightly inferior, and in point of speed and facilities of operation she outclasses the battle-



ARMORED CRUISER CALIFORNIA, TAKEN JUST AFTER THE LAUNCH.

ship type, and is, with her sister cruisers the Colorado, the Maryland, the Pennsylvania, the West Virginia and the South Dakota, designed to test the relative efficiency of the cruiser and the battleship.

The cruiser has a length between perpendiculars of 502 ft., an extreme breadth of 69 ft. 6½ in. and a mean draught of 24 ft. 1 in. and a displacement of 13,680 tons. The vessel is fitted with twin screws, vertical triple-expansion, four-cylinder engines and Babcock & Wilcox water-tube boilers, designed to develop an indicated horse power of about 25,000 for a speed of 22 knots. The vessel has a full bunker capacity of 2,000 tons and a normal coal supply of 900 tons.

The main battery consists of four 8-in. breech loading rifles in two balanced turrets and fourteen 6-in. rapid firing guns on

the broadside. The secondary battery consists of eighteen 3-in. rapid-firing guns, twelve 3-Pdr. rapid-firing guns, eight 1-Pdr. rapid-firing guns, two 3-in. rapid-firing field guns and six automatic guns. The vessel is also fitted with two 18-in. Elswick submerged torpedo tubes forward. Side protection to consist of a 6-in. belt at the water line and 5-in. armor on the top sides. The turret armor is from 6 in. to 6½ in. thick and the barbette armor is also 6 in. thick. The protective deck is 4 in. thick on the slope and 1½ in. on the flat. The complement consists of a crew of 690 men, with accommodations provided for thirty-seven additional for a flagship and a marine guard of sixty making a total complement of 787.

The date of the act authorizing the building of the California was March 3, 1899, the contract was signed Jan. 10, 1901 and



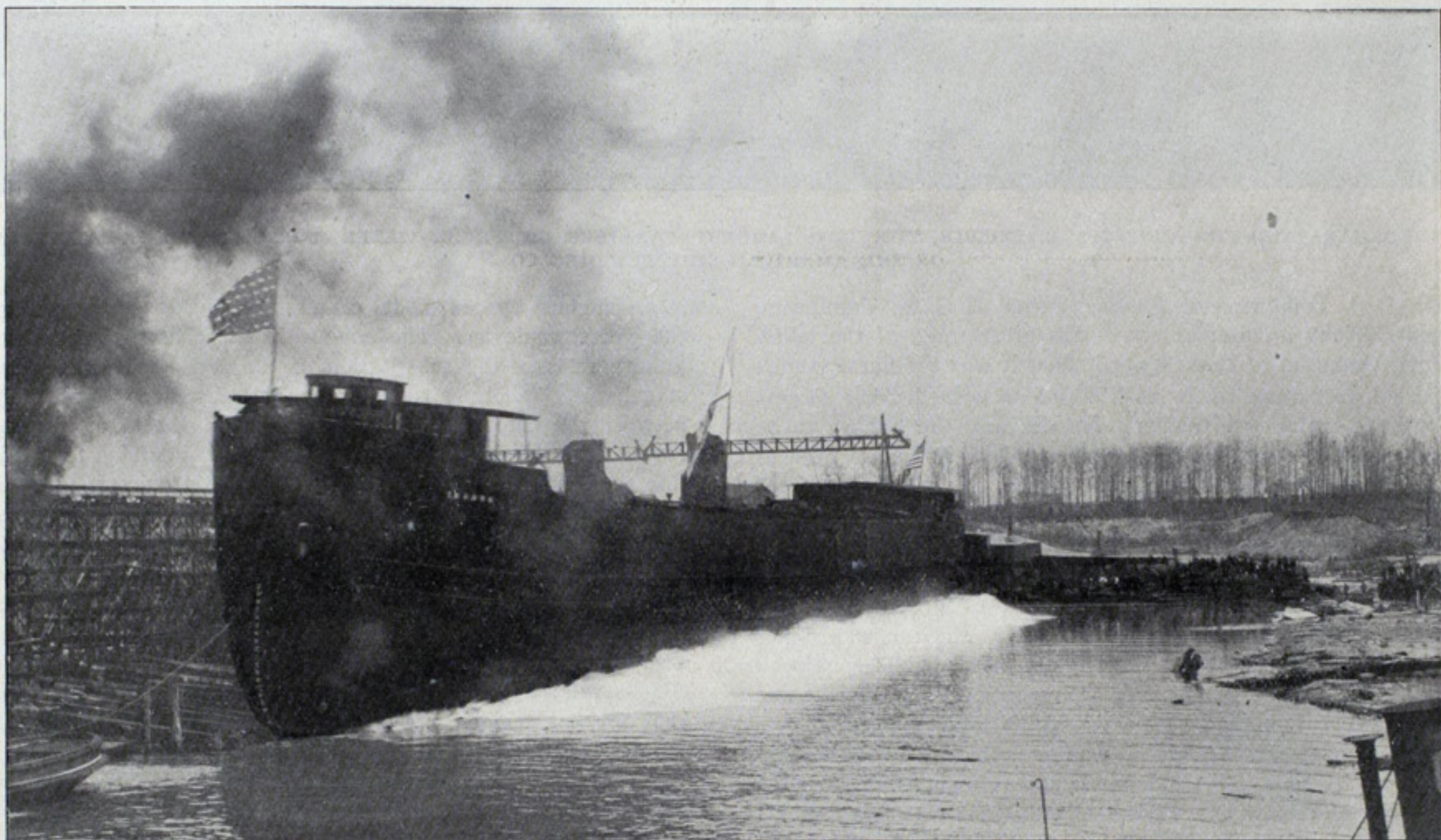
VIEW SHOWING EXCURSION BOATS AND PASSENGER CRAFT AT THE LAUNCH OF THE ARMORED CRUISER CALIFORNIA.

the keel was laid May 2, 1902. The contracted price of the hull and machinery is \$3,800,000.

The vessel was launched on convex curved ways with a camber of one in 300, the length of the ground ways from the forward poppet to the after end was 508 ft., the length of the cradle was 369 ft., the collective width of the ground ways on the one side was 36 in., the distance between centers of ground ways was 20 ft., the mean inclination of the ways at the center of the cradle at the start was one to 27½, the launching weight of the vessel including cradle was 5,980 tons.

In the successful launching of the armored cruiser California from the ship yards of the Union Iron Works, the mechanical skill of the state of California contributed another formidable addition to the navy of the United States. The California is the twentieth war vessel launched in Pacific

waters since 1888, all of them, except the harbor defense monitor Monadnock, were built on the ways of the Union Iron Works. The Monadnock was constructed at Mare Island navy yard. This formidable fleet comprises three battleships, one armored cruiser, four protected cruisers, one unarmored cruiser, two armored monitors, two gun boats, three torpedo boat destroyers, one torpedo boat and two submarine boats. All of these vessels, except one, the protected cruiser Charleston, which was the first of the fleet to be launched, are still afloat, the Charleston was wrecked on an uncharted reef in the Philippine waters after the acquisition of the islands by the United States. Two other cruisers, one armored, of the same type as the California, and the other unarmored, are now under construction at the Union Iron Works.

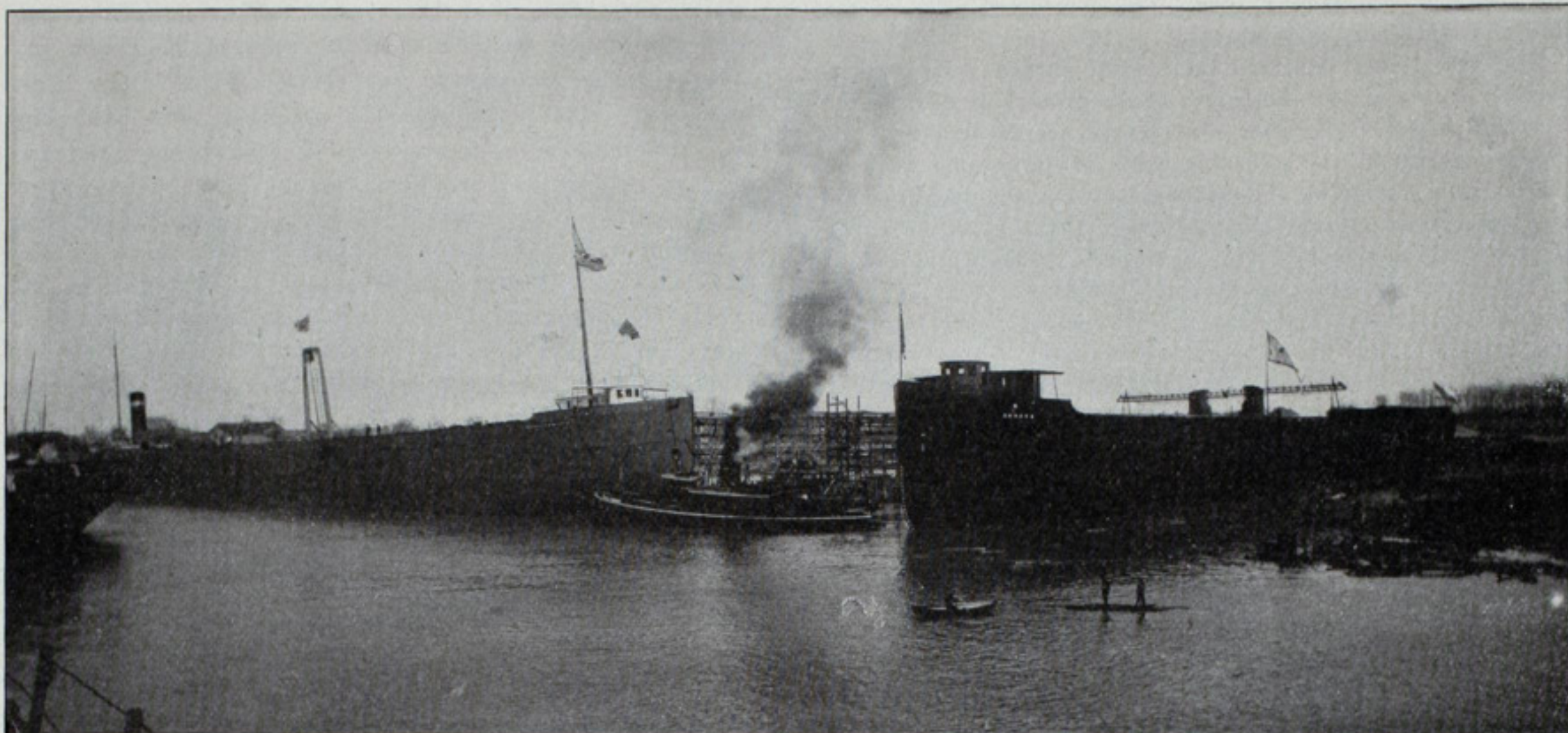


LAUNCH OF THE SAHARA AT THE LORAIN YARD OF THE AMERICAN SHIP BUILDING CO.

LAUNCH OF THE SAHARA.

On Thursday last, the Sahara, the second largest carrier on the lakes was launched by the American Ship Building Co. from its Lorain yard, for Mr. G. A. Tomlinson of Duluth. She occupied the adjoining berth to that from which the Augustus B. Wolvin, the largest carrier on the great lakes, was launched nearly a month previous. No fairer day could be wanted for a launch than that which marked the dip of the Sahara into her native element. Nor would it be possible to conceive of a launch more successfully executed. It was even more successful than the launch of the Wolvin, and if any proof of this assertion were needed it is only necessary to state that a mere slip of a girl, Miss Ruth Mauch of Hillsdale, Mich., launched the Sahara alone whereas it required the combined efforts of both Mrs. J. C. Wallace and Mrs. A. B. Wolvin to launch the Wolvin. It seemed as though it were but a second after the signal was given to cut the ropes before the Sahara was in the water. Miss Mauch, however, was equal to the occasion and smashed the bottle fairly across the bow of the steamer as she started down the ways. It was a very clean break indeed and its neck will be mounted in silver for her as a souvenir of the event.

It was precisely on the stroke of twelve when the Sahara took the plunge. A moment prior to that, say half a minute, Mr. J. C. Wallace had expressed his opinion of Edward Smith in one solemn and impressive ejaculation because the tug Frank W. had not put in appearance to take a line from the bow of the Sahara, but just at that moment the Frank W.'s nose rounded the bow of the Wolvin lying in the river bed. The line was taken with such dispatch that before one could say "Who killed Cock Robin" the Sahara was in the water. The special train conveying the launching party reached the ship yard at 11:30 and at 12:30 it left for the Clifton Club, where after an elaborate dinner, a number of most excellent speeches were made. Mr. J. C. Wallace, general manager of the American Ship Building Co., was both host and toastmaster, in which dual position he covered himself with honor. He commended Mr. G. A. Tomlinson for his energy and enterprise in projecting the Sahara and hoped that she would prove a most fruitful steamer, not forgetting to add the hope on behalf of the ship builders that she would also prove to be fruitful in repairs. Mr. Tomlinson made a brief and happy response in which he bestowed whatever credit there was for the building of the Wolvin upon Mr. W. A. Prime of New York.



THE SAHARA AND THE AUGUSTUS B. WOLVIN, THE TWO LARGEST CARRIERS ON FRESH WATER, LYING AT THE LORAIN YARD OF THE AMERICAN SHIP BUILDING CO.

Mr. S. J. Tomlinson of Pontiac, father of G. A. Tomlinson, spoke briefly on the subject of the great trade of the lakes. Capt. Davidson of Bay City, said that it was the finest launch he had ever attended in his life and he wished great success for both captain and owner. He declared the Sahara to be one of the most splendid properties that skill knows how to make and hoped that her earning power would be a source of gratification to her owner. When Mr. John A. McGean was called upon he rose to his feet and proposed a toast to the success of the Sahara. His speech was so very brief that it caused Mr. Robert Wallace, the dean of great lakes ship builders, to make the remark that if Mr. McGean was somewhat sparing in his words now he was nevertheless convinced by the appearance of the lady sitting next to him that at one time in his life he had been a very great talker indeed.

By all odds the best speech was made by the Rev. Dr. Ball of Muncie, Ind. This old gentleman is eighty-five years of age but of remarkable vigor. His thought was fine and his language equal to it. He referred to the struggle which has been going on for centuries between the elements of nature and the human intellect with the result that the intellect has finally triumphed and has created an object which has absolute mastery over the combined furies of wind and water. So majestic was his thought and so noble his language that it would have done honor to John Ruskin. Man indeed, as a gregarious animal, has never done anything greater than the building of a ship.

Among the guests were: Mrs. W. J. Mauck, Hillsdale, Mich.; Miss Ruth Mauck, Hillsdale, Mich.; Mr. and Mrs. E. B. Ball, Muncie, Ind.; Mr. and Mrs. Webb C. Ball, Cleveland; Capt. James Davidson, Bay City, Mich.; Capt. J. E. Davison, Bay City, Mich.; Mr. S. J. Tomlinson, Pontiac, Mich.; W. A. Prime, New York; Louis Struevel and Julius Siegel, Erie, Pa.; Capt. J. J. H. Brown, Buffalo; G. A. Thomas, Hillsdale, Mich.; Mr. and Mrs. J. C. Wallace, Mr. and Mrs. Robert Wallace, Mr. R. C. Wetmore, Mr. and Mrs. J. A. McGean, Mr. and Mrs. W. H. McGean, Capt. and Mrs. Charles L. Hutchinson, Mr. and Mrs. L. A. Johnson, Mr. and Mrs. Edward Williams, Mr. Henry Steinbrenner, Mr. Charles La Marche, Mr. Oliver Upson, Mrs. John A. Donaldson, Mrs. William Bailey, and Miss Ratsay of London, England.

The Sahara is 494 ft. over all, 474 ft. keel, 52 ft. beam and 29 ft. deep, with a 5-ft. water bottom. She has twenty-eight

steel hatches, spaced 12-ft. centers, removed and placed by the Brosseau device. The novelty in the construction of the Sahara rests in the substitution of the arch girder plate for stanchions. These girder plates are fastened athwartship between the hatches to web frames. This system of internal construction, designed by Mr. Tomlinson, is intended to facilitate the loading and unloading of the vessel since it forms a continuous hold unobstructed by stringers or stanchions. The Sahara is equipped with a triple-expansion engine, 22½, 36 and 60 in. cylinder diameters by stroke of 42 in., supplied by steam from two Scotch boilers, 13 ft. 9 in. by 11 ft. 6 in., equipped with Ellis & Eaves draft. The Sahara will be commanded by Capt. W. D. Ames, who last year sailed the Sinaloa of the Tomlinson fleet. She has been chartered for coal for her maiden trip by the Northwestern Fuel Co. It is intended to put 10,000 tons aboard her, if possible.

The keel for the Sahara was laid March 1; she was launched May 5, and three weeks hence it is expected that she will have her machinery and boilers installed and will be ready to go into commission. In other words, not quite three months will have elapsed from the laying of the keel until the vessel is actually in commission.

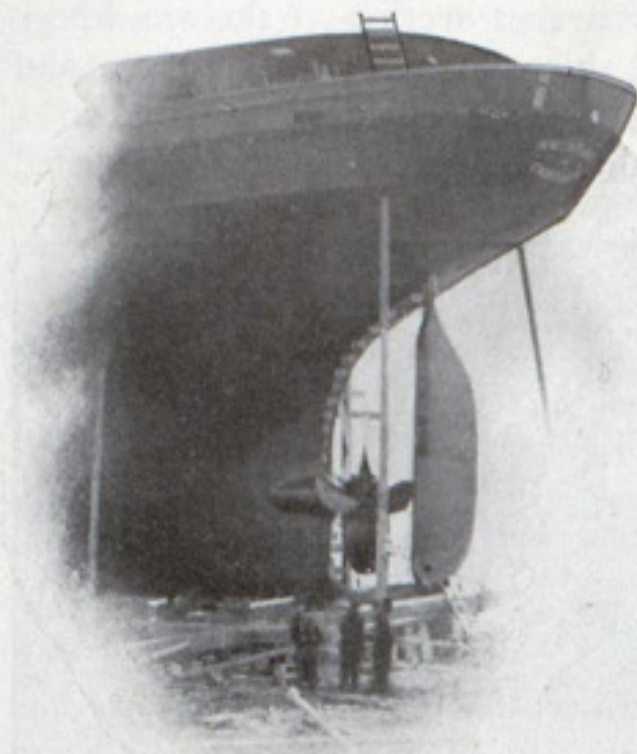
SHIP BUILDING DURING APRIL.

The bureau of navigation reports 103 vessels of 24,691 gross tons were built in the United States and officially numbered during April, as follows:

	Wood.				Steel.				Total.	
	Sail.		Steam.		Sail.		Steam.			
	No.	Gross.	No.	Gross.	No.	Gross.	No	Gross.	No.	Gross
Atlantic & Gulf.....	24	7,987	18	591	2	4,251	6	6,683	50	19,512
Porto Rico.....	1	21			.....	.....	.....	.....	1	21
Pacific.....	2	17	24	1,700	.....	.....	.....	.....	26	1,717
Hawaii.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Great L's.....	1	108	4	305	.....	.....	1	2,434	6	2,847
Western Rivers...	.....	.....	20	594	.....	.....	.....	.....	20	594
Total....	28	8,133	66	3,190	2	4,251	7	9,117	103	24,691

Three men were badly hurt by the explosion of a battery in Wm. K. Vanderbilt's turbine Tarantula at City Island, New York, last week. The kitchen under which the explosion occurred and the forecabin were wrecked.

GREAT LAKES ENGINEERING'S FIRST LAUNCH.



STERN VIEW OF THE ENGLAND.

The initial launch at the yard of the Great Lakes Engineering Works on Thursday last was successful in every particular. Of course, a launch in any event is a matter of grave concern to those most interested in it owing to the various elements of danger that enter into it, but a launch on new grounds and under untried conditions is an especially nervous ordeal, so that when the steamer R. W. England took the water easily and gracefully and

without any hitch whatever, everyone breathed easier and all hastened forward to congratulate Mr. John A. Ubsdell, who had the affair in charge.

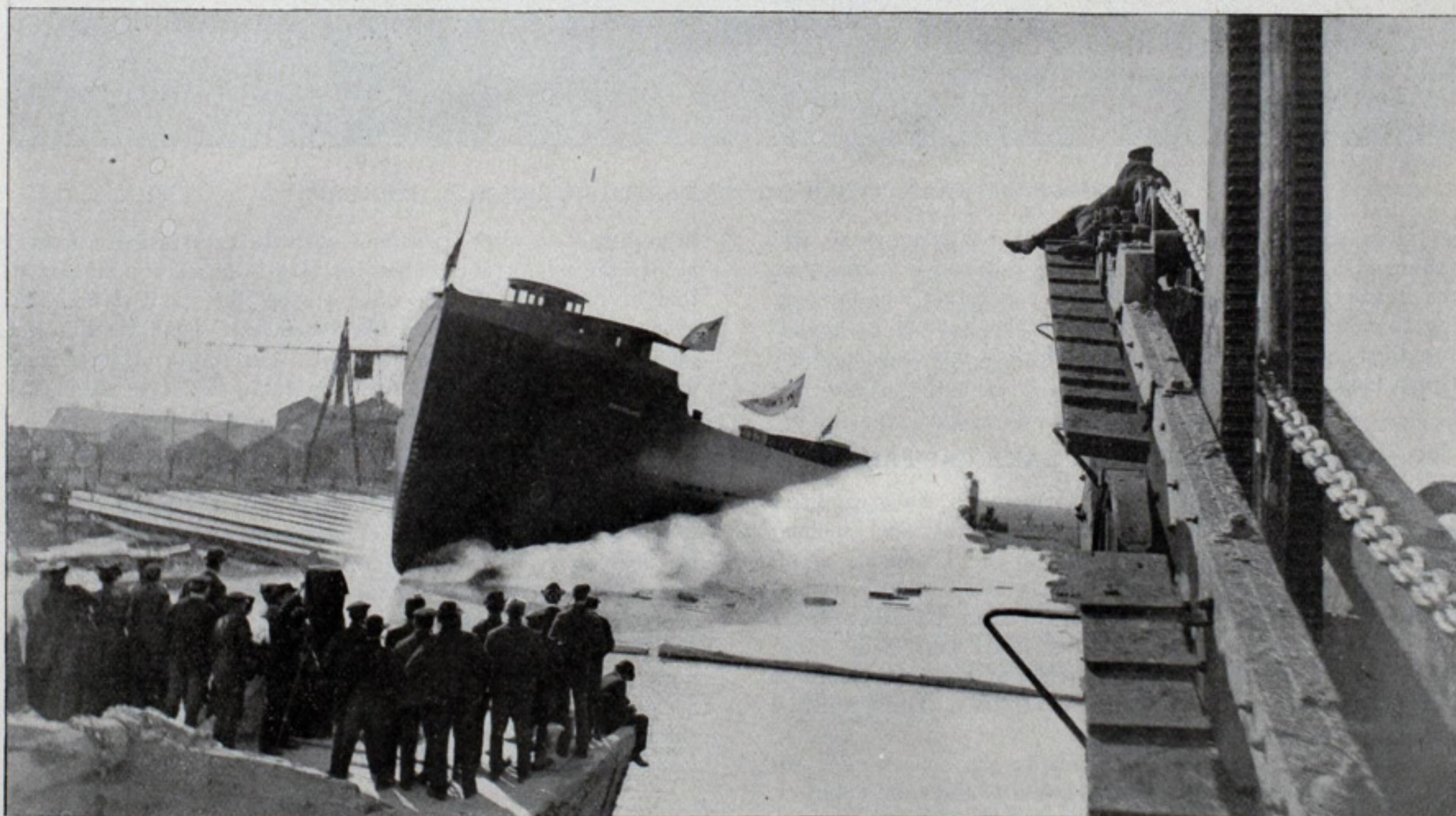
Very few people were really invited to the launch. It might be said that the christening party were the only one who were specifically invited. Nevertheless great numbers took it upon themselves to attend and a most pleasing instance was the fact that the school children from the Delray schools attended in a body and lent their childish trebles to the general chorus that emanated from animate and inanimate throats when the England took the water. It was certainly the best attended launch that has been held in Detroit for a great

MRS. GEORGE F. CLOUGH,
THE SPONSOR.

many years. It was also a gathering representative of the best citizens of Detroit and the state of Michigan, for it embraced interests prominent in shipping, banking, manufacturing and commercial pursuits, and it is significant that they attended on no more than a general invitation. A special train was run for their convenience from the Michigan Central station to the ship yard. Moreover, the villages of Ecorse and River Rouge apparently took a day off, for the inhabitants were certainly all at the ceremony. Many of the school children carried United States flags.

Shortly after 3 o'clock the launching party mounted the launching stand. Mrs. George F. Clough of Cleveland, the sponsor, daughter of Mr. Frank Seither of Cleveland, for whom the ship is building, was escorted to the stand by President A. C. Pessano of the Great Lakes Engineering Works. In her left hand she carried a huge bouquet of American Beauty roses and in her right the customary bottle of champagne. At twelve minutes past 3 o'clock the signal was given to release the vessel. Hammers struck the blocks in unison, the axes fell upon the ropes and seven seconds later the England was in the water. Mrs. Clough caught the bow of the England at the first suggestion of movement and broke the bottle across it, exclaiming "I christen thee R. W. England." Both bow and stern entered the water at the same time, throwing up a great wave which swept the marshes for over a quarter of a mile. She rolled once or twice and then righted on an even keel. During her descent on the ways whistles began to shriek, men to cheer and swing their hats and the children to wave their flags, and this was continued for several minutes. Luncheon was served in the drafting room after the launch.

The guests on the launching stand were: Mrs. George F. Clough, John W. Harder, Miss Annie Fisher, Mr. and Mrs. James Franklin, Dr. W. J. Shepard, Mr. and Mrs. D. E. McLean, Mr. and Mrs. H. W. Stecher, Mr. and Mrs. Frank Seither, Mr. and Mrs. Eugene Seither, Frank H. Seither, Mr. and Mrs. W. Genrich, Miss Addie Davis, J. L. Fontaine and sister, Mrs. H. H. Hartman, Miss Henrietta Hartman, all of Cleveland; Mr. and Mrs. Henry Seither, of Defiance, O.; Mr. and Mrs. Wm. Sauerwein, Sarnia, Ont.; Otto Ohming, Mich-

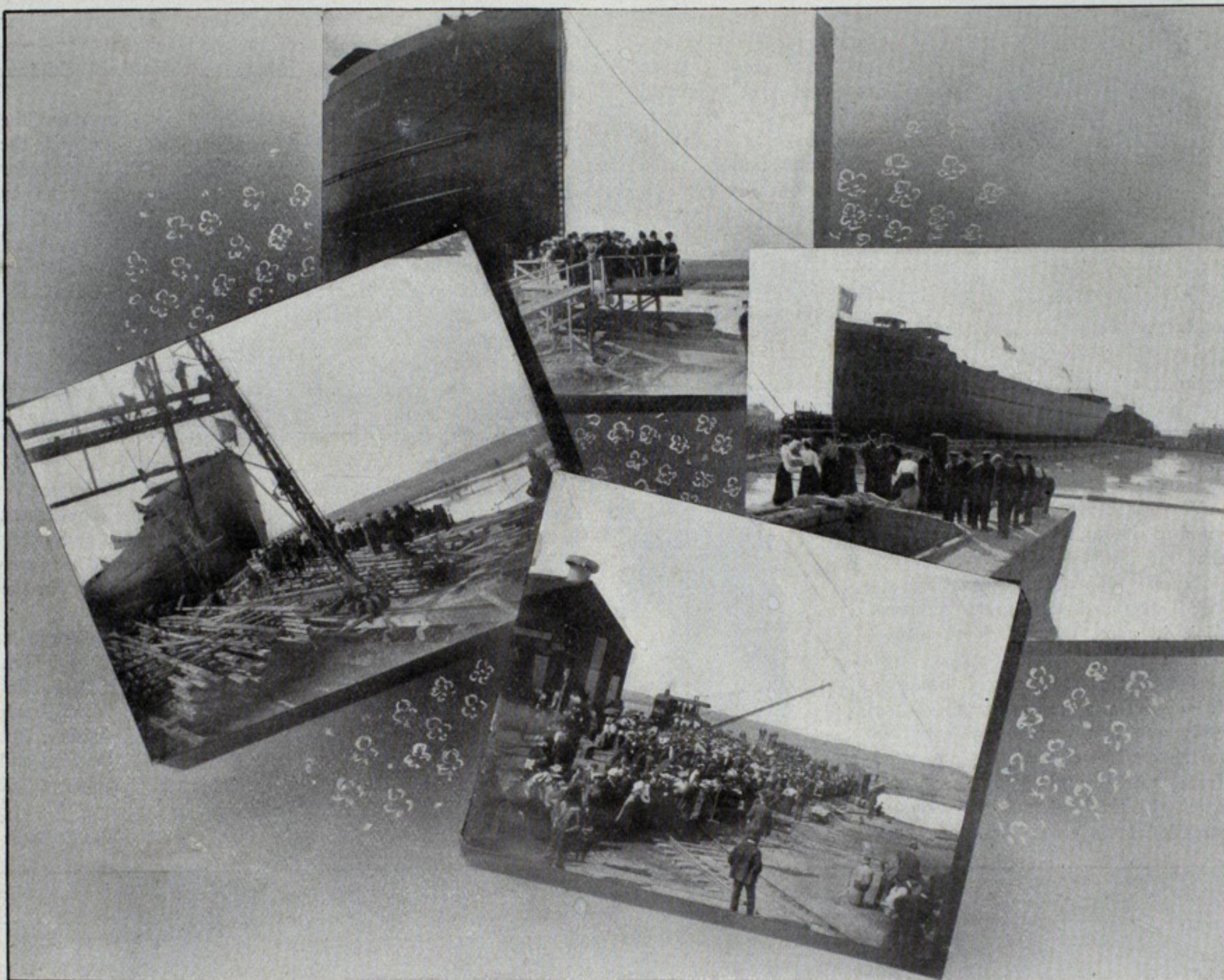


LAUNCH OF THE R. W. ENGLAND AT THE YARD OF THE GREAT LAKES ENGINEERING WORKS.

igan City, Ind.; Capt. and Mrs. R. W. England, Mr. and Mrs. J. J. L. England, all of Detroit. The ship building company was represented on the staging by A. C. Pessano, George H. Russel and John R. Russel.

The England is 376 ft. over all, 50 ft. beam and 28 ft. deep

while bringing her in where lines could be run from the ship. The ship made runs at night over a section of the sea where the currents were bad, did this six successive nights, and worked during the days. The chief engineer took down a pump in his own engine-room, made connections and assisted



SNAP SHOTS OF SCENES ATTENDING THE LAUNCH OF THE R. W. ENGLAND.

and was named after Capt. Robert W. England, who will command her. The machinery in the England is taken from the steamer V. H. Ketchum. In this connection it is interesting to note that the engine was built by Samuel F. Hodge, just thirty years ago, at the plant which is now a part of the Great Lakes Engineering Works.

PRAISE FOR A FORMER LAKE CAPTAIN.

Capt. J. H. McLeod, who was formerly in the great lakes service, but who is now in command of the steel steamer Palawan in the coast guard service in the Philippine archipelago, has been specially commended by Rear Admiral Robert D. Evans, for heroic work in saving the United States steamer Quiros, which grounded on a reef at Pearl bank, Sulu archipelago, and stood the imminent danger of going to pieces on account of the severe weather. Lieut. B. C. Decker makes the following report of the affair:

"I desire to express my gratitude to the commanding officer of the Palawan, Capt. McLeod, and to the chief engineer, Mr. Beach, and the officers for their assistance, for the encouragement they gave officers and crew, and for their advice. Also my appreciation in which the ship was handled

in getting it to work. I cannot wish the captain more, than if he has the misfortune to find his ship in a position similar to that of this ship, that he have a ship like the Palawan and officered as she is come to his assistance. That the ship got off the reef is due to the Palawan. The following days were days of bad weather, and the ship could not have stood any more nights such as the one before she got off."

This report has been endorsed by the rear admiral and by the civil governor of the Philippine islands. Mr. McLeod is well known on the lakes. He was last in command of the steamer Tuttle. He left the lakes during the Spanish war on the converted yacht Algonquin and was later placed in charge of a patrol boat around Cuba. He then enlisted in the quartermaster's department of the United States army and was in China during the trouble there two years ago. He is now, as stated, engaged in coast guard work in the Philippine archipelago. The Palawan was built in China and is quite similar to the Onondaga built by the American Ship Building Co. at Cleveland for the revenue cutter service.

Capt. Simon Lake, inventor of the submarine torpedo boat Protector, denied the report last week that his submarine had been purchased by the Japanese government.

LAUNCH OF THE INDIANAPOLIS.

The steel passenger steamer Indianapolis, owned by the Indiana Transportation Co., was successfully launched from the yard of the Craig Ship Building Co., Toledo, on Thurs-

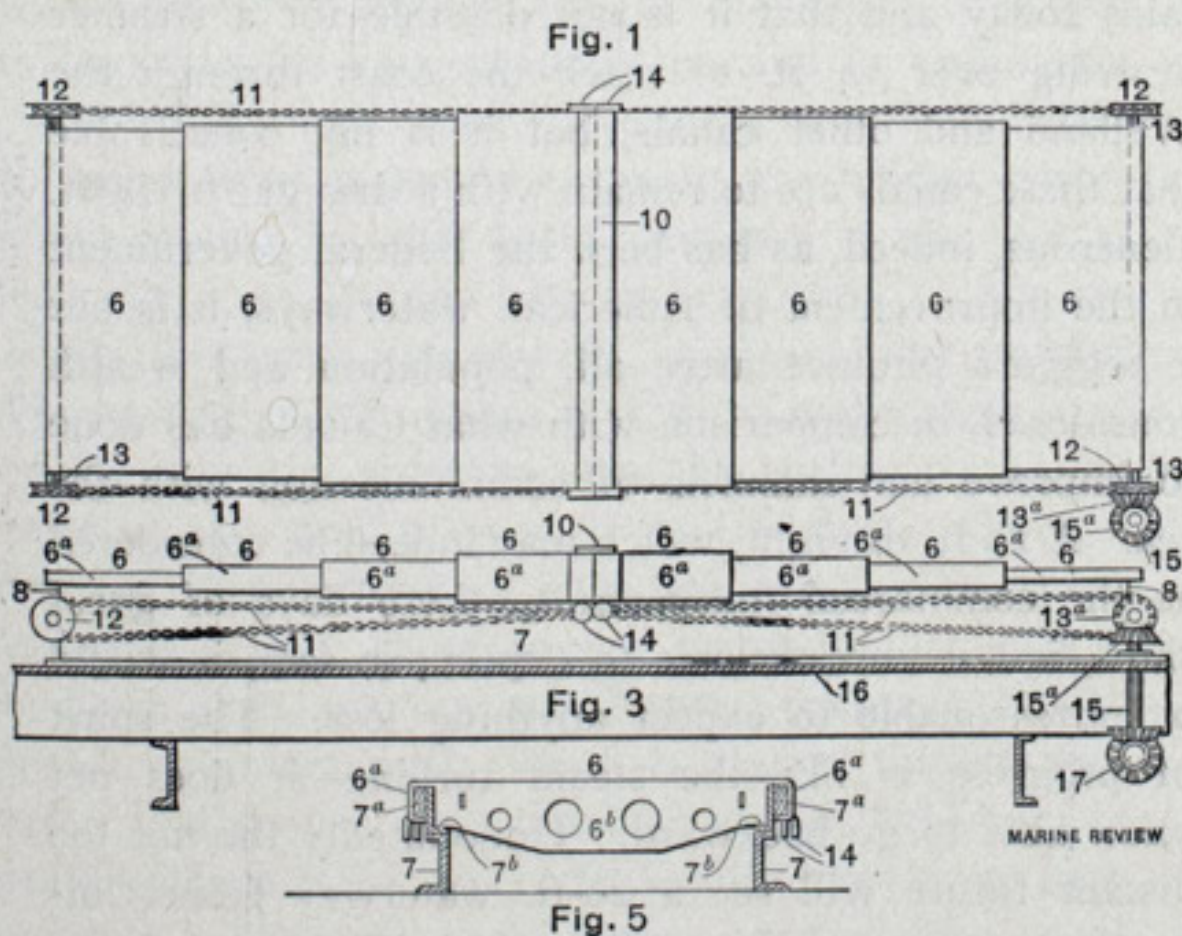


LAUNCH OF THE PASSENGER STEAMER INDIANAPOLIS FOR THE INDIANA TRANSPORTATION CO. AT CRAIG'S SHIP YARD, TOLEDO

day last. The steamer is 200 ft. over all, 185 ft. beam, 32 ft. keel and 14 ft. deep, and is equipped with a triple-expansion engine, 15, 25, 42 in. cylinder diameters by a stroke of 36 in., supplied with steam by two Scotch boilers 11 by 11 ft. She was launched with her machinery on board and is expected to be in actual service between Chicago and Michigan City within two weeks. The launching was made a social affair with elaborate ceremony and there were about 200 guests from Chicago and Indianapolis and about half a dozen other cities. Miss Eula Clay of Indianapolis acted as sponsor and christened the vessel with island wine.

BROUSSEAU HATCH FASTENERS.

The hatch fasteners used on the Sahara are the invention of Harry Brousseau of West Superior, Wis., who is connected with the Superior Ship Building Co. Their purpose is to form a continuous hatch fastener, opening and closing the device from a central station. The object of the device is to form an improved telescoping hatch comprised of several

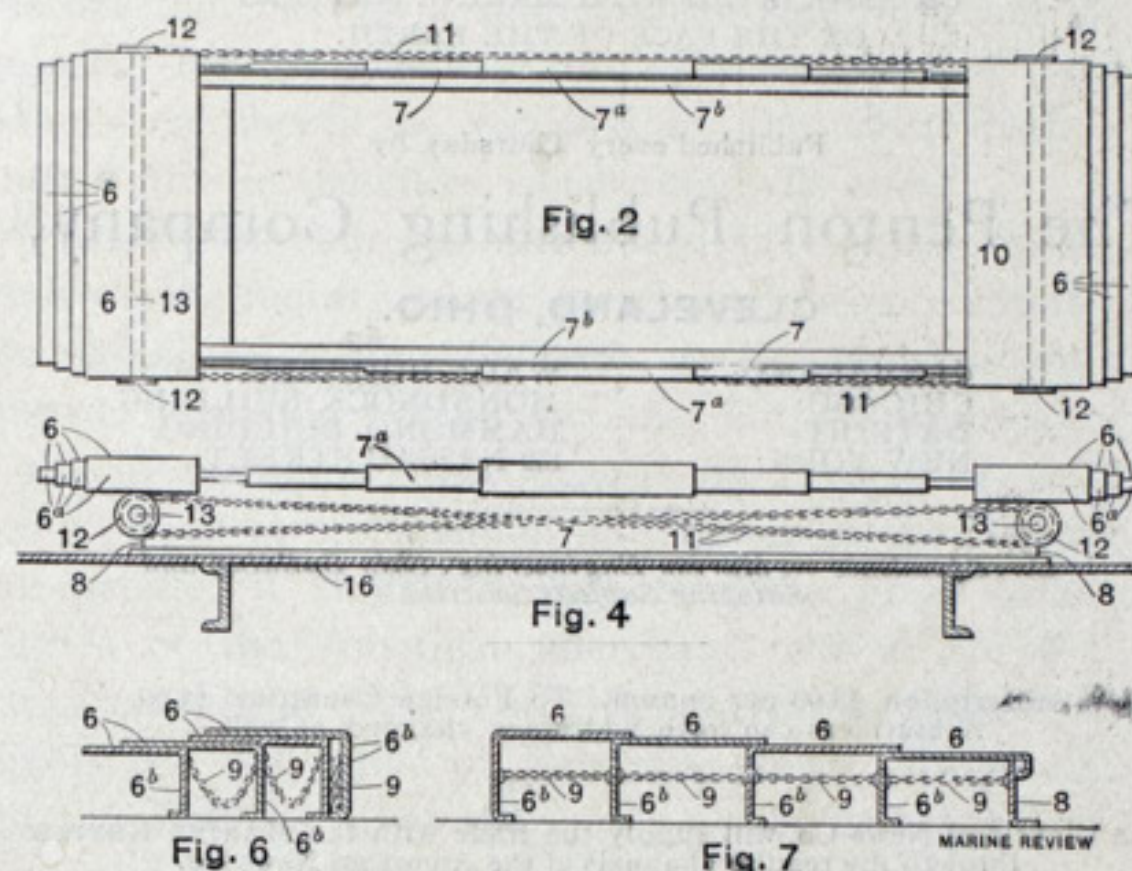


BROUSSEAU HATCH FASTENER.

parts which may be rested at the side of the hatchway to open it or extended to close it.

Fig. 1 is a plan of the hatch closed; Fig. 2 is a plan of the hatch open; Fig. 3 is an end elevation showing the deck in section with the hatch closed; Fig. 4 is a similar view with

the hatch open; Fig. 5 is a cross section and Figs. 6 and 7 are details in longitudinal section showing the hatch respectively partly open and closed and also showing a modification comprising a chain to hold the parts of the hatch in place. Referring particularly to the drawings the hatch as shown comprises overlapping pieces 6, which are free to slide upon each other. The head-ledges of the hatchway are indicated at 7 and the coamings at 8. Each plate 6 has depending end flanges 6a which are formed to hook under projecting rims, 7a, produced on or secured to the head-ledges. The plates and their flanges are progressively increased in size or stepped from the end of the hatch to the middle to receive each other



BROUSSEAU HATCH FASTENER

and the rings are also stepped accordingly. For the sake of strength and in use over wide hatchways, the hatch plates may be provided at their underlapping edges with depending truss flanges, 6b, and when so made the ends of the truss flanges rest on shoulders, 7b, produced in the head-ledges. It will be seen from this construction that the hatch plates will slide back and forth upon the rims and each other to close or open the hatchway, the movement of each plate in closing the hatchway being stopped by the appropriate step in the rims and in opening the hatchway the flanges, 6b, successfully contact and rest the part over the coamings at the end of the hatchway. In addition to the stepped construction of the rims the extension of the parts may be limited and separation prevented by chains, 9, extending between the truss flanges and when the hatch is telescoped the chains hang between the trusses as shown in Fig. 6. The hatch is shown formed in two sections, meeting at the middle of the hatchway, and 10 indicates a plate joined to one of the outer parts 6 to cover and close the crack at the middle. The hatch may be operated, as stated, by hand or by the engine of the ship through suitable connections or by an independent motor. It is intended that the line shafts should extend fore and aft to all the hatches so that they can be opened at once, if desired or by use of a clutch gear can all be opened one at a time. When telescoped the hatch takes very little deck space and also acts as a protection to the coamings.

In order to prepare for the removal from the Chicago river of the tunnels, the River Improvement Association was re-organized at Chicago last week with the following officers: Capt. D. Sullivan, president; Charles S. Deering, vice president; George Merryweather, treasurer and R. J. Dunham, secretary.

The steel lighter Kathryn was launched this week from the yard of the Empire Ship Building Co., Buffalo, for the Empire Limestone Co. She will have a capacity of 800 tons and is fitted with all modern appliances.



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In the potentiality for doing good to American shipping the present year is probably the greatest which the United States has experienced since it became a nation. Congress in addition to passing measures calculated to extend the natural trade which belongs to American craft has also appointed a commission to inquire into the state of the merchant marine in general. In the passage of this measure congress has manifested a desire to get at the truth. That is all the friends of American shipping wish—the truth.

The commission of five senators and five representatives as appointed is a thoroughly competent one, and will through Mr. Winthrop L. Marvin, a most capable secretary, so compile and arrange the data as to make it easily digested. In order that these ten men may thoroughly cover the country they have been subdivided into committees for the Atlantic and Pacific coasts and the Great Lakes. These are the three great geographical divisions, from the maritime standpoint, of this united country. Special efforts will undoubtedly be made by these various sections to accord to the sub-committees every opportunity to obtain the fullest possible information. The sub-committee which comes to the great lakes is especially fortunate, because it will come into the heart of the greatest industry that the world has ever known. The making of iron is undoubtedly the most imperial of all the arts known to man, for it is the basis of indus-

tries so diffuse that the mere chronicle of them would be tedious. The members of the commission will find on the lakes the greatest fleets in existence that are devoted to a single trade. To find larger ships than those which perform the daily business of the great lakes they will have to confine themselves to a list of latterday ocean liners that might be counted on the digits.

Rumors, sometimes vague and sometimes tangible, have been circulated concerning the hostility of coast interests to lake interests and vice versa. It has even been represented that a United States senator, distinguished among those who have advocated the up-building of the American merchant marine through favoring legislation, has declared that he would support no measure which permitted the great lakes to share in its operations. If this is true it is a pity that so great a man should have so small a view.

Why is not Chicago as much an American seaport as New York? It is not separated from the sea but joined to it by 2,000 miles of fresh water. It owes allegiance to the same flag which floats over New York and its devotion to that flag is quite as pure. Ships have gone from Chicago to Liverpool and they will go again. One has only to stop to think for a moment to perceive that this merchant marine question is as big as the nation. Ships can come from the China sea right into the heart of this country, bringing their teas and coffees and spices and taking away our agricultural machinery and rails and grain. Buffalo, Cleveland, Toledo, Detroit, Milwaukee, Chicago and Duluth are quite as much American seaports as are Boston, New York, Philadelphia, Baltimore, Charleston, Galveston and New Orleans. They are all the common property of the United States and they should be treated as one.

Of course, it is true that limitation of draught obtains today and that it is not possible for a steamer drawing over 14 ft. to reach the coast through the Welland and other canals, but it is not conceivable that these canals are to remain with a draught of 14 ft. Generous, indeed, as has been the Federal government in the improvement of American waterways, it is but a beggar's pittance after all, population and wealth considered, in comparison with what Canada has done to improve her channels of communication with the sea. A 20 ft. draught, which may indeed be considered as the commercial minimum in these days of great ships, is not unreasonable to expect; in fact, it would be unreasonable to expect anything less. The spirit of progress is like the steam turbine—it does not know how to go backward. Undoubtedly the not too distant future will see a 20-ft. waterway from Chicago to the sea. How much this will contribute to the improvement of the material welfare of mankind it is impossible to predict. Every cheapening of the cost of transportation has vastly added to the sum of creature comforts and has distributed them widely among all classes of people. It is only when things

are cheap that they are enjoyed by the many. Few have riches. Nothing has contributed so much to the dissemination of the good things of life among the people as the lessening of the cost of distribution. It is the waterway which has dominated the rate and compelled the reduction, because it is by nature the cheapest known mode of conveyance. It is the great roadstead which never requires the subtraction of a cent for depreciation or the expenditure of a penny for replacement.

It is nature's great highway which must forever remain uncurbed and uncontrolled by monopoly. Trusts can never possess it. It can never gravitate into the hands of a few as the railways are in danger of doing. It belongs to the people wholly and absolutely and must always continue to be the great leveler of rates. This is the great heritage which nature has bequeathed to all men upon absolutely equal terms. One might as well try to corral the winds of heaven as to control the lanes of the sea.

When one considers the volume of commerce and freight to be carried the expenditure necessary to make these canals of ocean draught is as nothing compared to the sum which has already been expended upon the great canals of the world. Here is a latent commerce which needs only to be unshackled to overrun the world. What would Manchester, Keil, or even Suez be compared with it? Suez, the most famous of them all has not one-fourth the commerce of Sault Ste. Marie and as for Panama, which is to cost from \$150,000,000 to \$200,000,000, it will not for many years have more than a tenth of Sault Ste. Marie's commerce.

In this great question of maritime development, shipping interests are, after all, only an incident. The commerce which it quickens into life is the thing. It will serve to give to the United States a proportionate share of the markets of the world to which its resources, its various industries and its population entitle it. Is there a man alive today who would dare to dream what it would mean to the United States in the contest for the world's markets if she had as many ships as Britain has, in proportion to her resources, her coast line and the number of her people? What a frightful handicap it is for a manufacturer of reapers who, in order to send his output to South America, has first to send it to Liverpool, where it may be transferred to a ship engaged in the South American trade. Does anyone maintain that such a condition does not operate to the advantage of the British manufacturer? Blood is always thicker than water. Moreover, the missing of the schedule of transshipment at Liverpool by even a few hours may result in a delay of weeks before another ship is secured and this in turn has actually operated to throw the reaper out of commission for a whole season. The makers of harvesters and reapers and of industries subsidiary to them in the middle west, the agricultural interests of the inland states, the cotton growers of the

south and the manufacturers of New England are all deeply concerned in this great national movement for the uplifting of the American merchant marine. The Chambers of Commerce, the manufacturing and financial interests of the cities of the great lakes as well as those of the New England and coast states should all unite to enlighten the commission that they are engaged upon one of the gravest problems that has ever confronted a body of men; that it is a problem which vitally concerns the welfare of the nation; that it is one that has not a single selfish side to it, but is projected for the benefit of all. The members of this commission should be received by the most distinguished men in the cities which they will visit.

Whatever measure is introduced in congress as a result of the inquiry of the merchant marine commission should be a common one. It should be broad-gauged; it should not be sectional but all-American; it should recognize that, beautifully diverse as this country is, it is the common inheritance of the American people; it should declare that the great beneficiaries of the American merchant marine are the manufacturers of New York, Pennsylvania, Ohio and Illinois and the farms of Nebraska, Iowa, Minnesota and the Dakotas; that there is no spot in this great domain of 75,000,000 people which is not interested in the American ship.

What is wanted is to remove the barriers and the handicaps and to obliterate entirely all geographical distinctions. There is no reason why ship builders of the lakes may not build a certain proportion of tonnage for the American navy and for the ocean trade; there is no reason why the ocean coastwise vessels may not come to the lakes and there is no reason why the coast builder may not build for the lakes.

It is to be hoped that the report of this commission will be the last word on the subject. If it is not, it will be the fault of the commission, for every opportunity will doubtless be afforded to them to point out the ailments and to provide the remedy. If the avenue to rehabilitation does not lie through direct subsidies, then let us abolish the thought of subsidies altogether; if it lies in a preferential tariff upon goods brought to the United States in American ships, then let us have preferential tariffs.

As far as the great lakes are concerned, the cities along its shores will light fires that will illuminate the entire Atlantic seaboard and will do all that they can to convince the commission that the subject which it has in hand is one intimately associated with the welfare of every American for when the great lakes become a feeder for the American merchant marine on the high seas, everyone, capitalist and laborer alike, will be drawing dividends from the augmented volume of trade that must inevitably follow.

There is a mighty small crumb of comfort in the final outcome of the dredging case in Washington. Two dredges are under way for the great lakes—one for

service in Lake Erie and the other for service in Lake Michigan. As far as the Lake Erie dredge is concerned the war department was authorized to divert money from the appropriation for the improvement of Lake Erie harbors to pay for the construction of a dredge, but no such authority could be found for the construction of a Lake Michigan dredge. Attorney General Knox, however, to whom the question was submitted as to the legality of the construction of the Lake Michigan dredge, appears to hold that it is lawful. Both dredges will therefore be built to compete with private capital which went into the dredging business in good faith. The saving clause is that the rivers and harbors bill carries a provision that no more dredges shall be built without specific consent from congress. As far as the lakes are concerned this is very much like locking the stable door after the horse has been stolen.

"THE MAN AT THE WHEEL."

The American public have during the past year or two become so accustomed to reading about the labor disturbances that are constantly arising, are in progress, or being adjusted, that they are beginning largely to regard this situation as a matter of course. We hear each day of the ever-increasing radicalism of the chosen leaders of this vast Army of Unrest with but slight concern, until some particular feature affecting some interest or phase of this sociological problem is brought directly home to us, and then we become strongly aroused and indignantly proceed to inveigh against labor organizations, those who direct their affairs and all connected therewith.

The one great trouble lying directly at the base of this entire proposition is the fact that its importance and strength have been wilfully discounted and underestimated by the employing interests of the country.

The average employer, if at all successful, is a man invariably who has made a constant and close study of almost every detail of his business requirements, no matter how complex the ramifications of the problems involved.

But when it comes to the question of his labor, the one item that surpasses all others in expense, instability or uncertainty of control, we find so often on the part of the employer a sort of vainglorious feeling of self-sufficiency that has had much to do with the extent to which the employers not only of America, but Great Britain and other countries as well, have been compelled to face frequently a situation that has been conspicuous for its surprising and unexpected results.

The constant insidious and largely unseen work of the labor movement in America during the past decade laid a foundation for the rapid growth of the past few years when, with the support of a period of business activity, the machinery that had been put in motion was in a position to take advantage of the situation in every way.

A demand for changed conditions became the order of the hour, and labor, intoxicated by its suddenly developed strength, and urged on by leaders that were inspired by all sorts of motives, has come to be a power that it is feared is not yet fully appreciated or understood by employers generally as it should be.

And the worst of it all is, that the end is not yet.

And the employers of the country, taken as a class, are very greatly responsible for the intolerable conditions that exist and for the impossible conditions that would appear to be in sight.

If they are not largely responsible, and if they have done

their best and acted with average judgment, then it must be conceded that they are largely helpless to stand the tide of this all-powerful torrent of agitation, disturbance and lawlessness that is rapidly plunging this country into a state of chaos.

Because that is what is coming, and unless a very radical change in the policy that has actuated those who are and who are going to be the chief sufferers is not quickly made, the whole industrial structure of America is going to undergo a volcanic-like upheaval that is sure to leave widespread ruin in its wake.

This sounds just a little harsh, and perhaps there may be those who will take violent exception to some of the foregoing, but it comes pretty near being the truth just the same.

If you do not believe it, look around.

Look at the result and the record of lawless disturbances all over America during the past year. Examine the consequences to both capital and labor in many of our industrial centers. Witness the daily havoc in cities like New York and Chicago as indicated in every issue of every morning newspaper for three years past, and last, but not least, study for a moment the situation as it exists on the great Inland Seas that carry the bulk of America's merchant marine and just beginning to show on the Atlantic and Pacific coasts, and you have a picture, if it is carefully observed, that ought to make every loyal American citizen shudder.

The end is not yet.

Should the result of the elections this year in this country be of such a character as to reassure our financial interests, and should America again be blessed with good crops, is it not reasonable, is it not natural, is it not mandatory upon us to look forward to a prosperous year, at least during 1905?

And yet there is a shadow upon the horizon that may indicate the evidence of a storm that if unprovided for by the adoption of active measures may scatter universal destruction in its wake and the business stagnation we have hitherto seen in a few localities may be just as widespread in America as it was in England a few years ago.

Is there a man alive in this country today who could have accurately foretold the labor situation five years ago?

Is there a man—employer or employe—who can foretell what it may be five years hence, or even one year hence? The prosperity of the employer cannot be possibly affected or retarded without the employe suffering likewise?

But the employe runs comparatively no risk; if he cannot work in one place he can in another, and what may be infinitely more to his liking, he may prevent others from working, and receive good wages from his organization while so occupied.

And all the time the employer is paying dearly for a condition, perhaps of enforced idleness, receiving indifferent protection from the law or the law's servants, for whose support he is taxed, while the man who has nothing and can lose nothing, is stopping at will the wheels of industry and, with a ghoulish glee, luxuriating in and enjoying every evidence of inconvenience on the part of those who have perhaps been his best friends.

And as far as the employer is concerned, is he not really, after all, somewhat to blame, and is he not reaping the harvest sown by his own lack of foresight, indifference or narrow selfishness?

Either this condition of affairs can be remedied or it cannot.

If it cannot be remedied, then every employer in America is at the complete mercy of the law-despising element which is more or less in control of every labor organization in the country.

Because these men, one and all, have either no appreciation of what our laws are or for what purpose they are intended,

or they entertain a contempt for them that would seem sometimes to be justified.

In the very first place, we are confronted every day with the emphatic demand that the employer shall employ none but those that belong to some one of the thousands of unions that exist in every part of this country, and that, moreover, he shall sign a document to that effect, or all the horrors of the strike, from the stoppage of his business to murder, perhaps, shall be visited upon him.

And yet there is not a labor leader or an employer in America who does not know that this demand itself sets aside every fundamental principle of our government, from the Declaration of Independence to all the court decisions ever rendered upon the point in any way in this or any other civilized country.

To maintain this equality of manhood and its rights in America we have given, through many costly and fearful wars, both for the sake of those living under its flag and those who had no just claim upon us.

And yet, calmly and without any blush whatever, and with the strictly union agreement in one hand and the strike bludgeon in the other, organized labor stalks up and down the land, compelling acquiescence to its many humiliating conditions or threatening the disaster that the long-suffering employer hopes by temporary concession to avoid, but which he is by this temporizing and conceding for peace's sake only rendering more certain.

Unless—

Unless the employers of America wake up, get really wide awake, and realize fully the extent to which they are being borne rapidly to a conflict that must be a sorrowful one to both them and their employes, and the country at large.

They must unite their interests upon this one question of labor as firmly as if they were members and stockholders of the same corporation, and they must be just as willing to submit the absolute control of these questions to those who have them in charge, as they are now willing to leave the guidance of other affairs to those who occupy the positions of responsibility.

In this issue no man is independent; none stands alone. All are affected by what the other does, and the precedents that some other employer, urged by some real or fancied pressure, may feel he should yield to.

Organized labor is only in a measure following out an inexorable law of exacting and trying to secure all that is possible.

Its leaders are at least capable and clever, if not guided by a high-minded conception of what is right and wrong; and, in the light of the success they have won, it becomes no man to make light of their powers.

They all know each other; they are united; they never rest; are never satisfied and never will be, but are constantly being spurred on by this or that concession won from some weakly situated employer, and are only checked by a united and determined front upon the part of their employers and from which they can see no loophole for escape.

They are well informed and self-reliant, and when successful are strong; but when compelled to stand their ground or when confronted by a show of strength that they cannot intimidate and which they realize means business, they are invariably just as quick to make terms and wait for the next chance.

The labor organization has come to stay.

It owes its present prestige largely to the employers' lethargy and lack of cohesiveness; but when once the lessons of dearly bought experience are brought home to the American employer as a class, he will be as quick to act in this as in

other directions; and the measure of his success will be in direct ratio to the extent he is willing to set aside his own personality and pride and join hands with his fellow employer for the good of his country, his own business, that of his fellow employer and his employe.

There is no other way out.

On the one hand, the grim spectre of business ruin confronts him, and on the other, a certain measure of comfort and satisfaction.

It has been done before, is being done now in a measure, and some day will be the universal rule, greatly to the benefit of all concerned.

ORE ON LAKE ERIE DOCKS, MAY 1, 1904.

The amount of ore on Lake Erie docks on May 1 of the present year is greater than it has been for any year during the past decade, and probably greater than has ever before occurred in the history of the trade. The amount is 4,534,103 gross tons. That the amount on dock would exceed the total of former years was, of course, expected as furnaces were pretty well stocked up when navigation closed and since that time a number of them have been banked. The amount of ore moved from the docks to furnaces since the close of navigation was 1,836,982 gross tons. The total amount of ore moved over Lake Erie docks to furnaces in the full year ending May 1, 1904, is 18,739,995 gross tons, as against 21,905,251 tons in 1903 and 17,216,065 tons for the year ending May 1, 1902. The movement of ore, therefore, over dock to furnace for the year ended May 1, 1904, is 3,165,256 tons less than it was for the corresponding year of 1903 and 1,532,930 greater than it was for the corresponding year of 1902.

Figures showing the total ore passing to furnaces over Lake Erie docks in the year ended with the first of the present month are found in this way: We know that on Dec. 1, 1903, Lake Erie docks contained 6,371,085 tons of ore; deducting from this 4,534,103, the amount of ore now on dock, we find that shipments to furnaces from Lake Erie ports during the winter period (Dec. 1 to May 1) amounted to 1,836,982 tons, which added to 16,903,013 tons, the amount shipped to furnaces during the navigation season of 1903, gives 18,739,995 tons as the entire consumption of ore from Lake Erie ports during the year ended May 1, 1904, as against 21,905,251 tons in the year ended May 1, 1903; 17,216,065 tons in the year ended May 1, 1902; 14,468,260 tons in the year ended May 1, 1901; 15,882,881 tons in the year ended May 1, 1900; 12,122,982 tons in the year ended May 1, 1899, and 10,209,488 tons in the year ended May 1, 1898. The following table gives full details of stocks and shipments to furnaces during several years past:

IRON ORE ON LAKE ERIE DOCKS—GROSS TONS.

PORTS.	Opening of Navigation.			Close of Navigation		
	May 1, 1904	May 1, 1903.	May 1, 1902.	Dec. 1, 1903.	Dec. 1, 1902.	Dec. 1, 1901.
Toledo	160,216	126,331	111,511	106,710	310,023	254,196
Sandusky	68,863	56,500	37,400	95,275	95,175	47,384
Huron	208,008	147,817	129,635	253,249	232,764	231,501
Lorain	237,404	190,311	96,992	288,581	328,304	195,863
Cleveland	968,508	829,347	624,865	1,337,750	1,500,604	1,378,060
Fairport	579,677	555,709	472,325	845,946	924,236	710,590
Ashtabula	1,559,028	1,073,967	924,742	1,911,911	1,967,136	1,769,145
Conneaut	128,018	125,400	152,891	591,364	673,679	604,106
Erie	474,275	426,744	223,972	657,409	722,966	470,718
Buffalo	150,106	60,241	73,861	282,890	319,367	198,100

ORE ON LAKE ERIE DOCKS, MAY 1, EACH YEAR FOR TEN YEARS PAST.

Year.	Gross tons.	Year.	Gross tons.
1904	4,534,103	1899	2,073,254
1903	3,592,367	1898	3,167,915
1902	2,848,194	1897	3,256,497
1901	3,050,183	1896	1,949,698
1900	1,720,656	1895	2,642,890

ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, FULL YEARS.

Year ending	Gross tons.	Year ending	Gross tons.
May 1, 1904.....	18,739,995	May 1, 1900.....	15,882,881
May 1, 1903.....	21,905,251	May 1, 1899.....	12,122,982
May 1, 1902.....	17,216,065	May 1, 1898.....	10,209,488
May 1, 1901.....	14,468,260		

IRON ORE SHIPMENTS, LAKE ERIE PORTS TO FURNACES, DURING WINTER PERIOD, DEC. 1 TO MAY 1.

Winter of	Gross tons.	Winter of	Gross tons.
1903-04	1,836,982	1899-1900	3,809,627
1902-03	3,481,887	1898-99	3,063,153
1901-02	3,011,469	1897-98	2,755,840
1900-01	2,854,487		

LABOR SITUATION ON THE LAKES.

The difference between the Lake Carriers' Association and the Masters' & Pilots' Association are no nearer a settlement than they were a week ago, practically speaking. The week was virtually consumed by the decision of the directors of the Masters' & Pilots' Association to submit the proposition of wages for the coming season to a referendum vote, that is to say, to let the various harbors themselves vote upon it. The various harbors took the vote and almost unanimously voted to reject the proposition of the Lake Carriers' Association. The offer of the Lake Carriers' Association is to pay last season's scale and to allow the masters pay for the full season of nine months if the vessels were in commission from June 15 to Nov. 1. Under this plan, of course, the owners would continue to make individual agreements with the masters in regard to wages. The masters very sensibly waived the provision in their demand that a master could not be discharged without first submitting the question to an arbitration committee, and as this was supposed to be the only stumbling block, it was expected that agreements would have been entered into by this time. At this writing no one can tell what the outcome may be for the present situation is practically a deadlock. The executive committee of the Lake Carriers' Association will consider the subject today (Thursday).

The officials of the Marine Engineers' Beneficial Association have entered into an agreement with the Lumber Carriers' Association for the season. Owing to the unfavorable conditions existing in the lake trade at present, the wage schedule has been shaded somewhat. No change is made in steel vessels and all boats of that class engaged in the lumber trade will pay the wages and carry crews according to card adopted by the Marine Engineers' association. On steel steamers chief engineers will get \$125 a month and the seconds \$90 a month. The wooden boats are divided into six classes and the schedule adopted for wooden steamers is as follows: Over 1,000 tons, chief \$120, seconds, \$90; over 800 and under 1,000 tons, chiefs \$114, seconds \$84; over 600 and under 800 tons, chiefs \$110, seconds \$80; over 300 and under 600 tons, chiefs \$105, seconds \$75; over 200 and under 300 tons, chiefs \$90, seconds \$65; under 200 tons, chiefs \$85, seconds \$60.

The Lake Carriers' Association and the Seamen's union have reached agreements on all points including wages, but the officials of the union will not sign an agreement unless the cooks and stewards are included. The wage schedule is the same as last year, with the exception that no extra wages will be paid for the work performed in port. The wheelmen, watchmen and lookouts will get \$45 per month up to Oct. 1, and \$65 per month for the balance of the season. The deck hands will be paid at the rate of \$25 per month up to Oct. 1 and \$37.50 for the balance of the season. Mates and engineers on barges will get \$10 a month more than the seamen on the same vessels. The cooks apparently do not know where they belong, and the lake carriers naturally want to know whom they are dealing with before they sign a contract. Some of the cooks are with the Seamen's union and others with the Longshoremen's union.

AFFAIRS AT HEAD OF THE LAKES.

Duluth, May 10.—Some vessels are moving at this end of Lake Superior and the ice, though still in large fields, is soft and may make no more trouble. The small steamer Bon Ami of the White Line, has been down the north shore to Grand Marais, and returned without interference by ice, and if such a boat can make it there is nothing to hinder a larger vessel. The boats of the Booth company are starting out this week for lower Lake Superior points. But there is little movement of big ships in the harbor, though a few have taken wheat and flax cargoes and are ready for business as soon as the Masters' union matters are out of the way. The unsettled state of affairs with reference to the negotiations between owners and masters is the disturbing element, and no one seems to know when interlake navigation will really begin. Package freight lines have cancelled all tariffs and will wait the conclusion of negotiations. None of the flour milling interests of the head of the lakes want to sell flour, even if they can, for they cannot tell what routing they may have to make, and they do not want to sell flour on a lake and rail basis and ship it on an all-rail schedule.

There has been some discussion as to what the term "opening of navigation" may mean, for it is a question of importance to grain and other shippers. The rule of the Duluth Board of Trade on this point, governing grain contracts, is as follows: "The opening of navigation shall be construed to mean the arrival in Duluth harbor of the first vessel from the lower lakes, and that the entrance or entrances of the Duluth-Superior harbor are free from obstruction by ice. In the event of ice returning in sufficient quantity to obstruct navigation then all contracts based upon the 'opening' shall be extended for as many days as such obstruction exists. On contracts for grain sold for the opening of navigation the seller shall have ten days from such date."

GRAIN SITUATION AT DULUTH

Duluth, May 10.—There is in the neighborhood of 2,000,000 bu. wheat sold and under charter to go out from the head of Lake Superior at the opening of navigation. This is out of 4,500,000 bu. on hand here. Not a bushel of this is on foreign account, as no export sales have been made for a long time. Practically all wheat sold for export in the northwest has been from Port Arthur and Fort William, where there are now some 6,500,000 bu. in store. How much of this is sold for Europe it is impossible to state, but it is no great quantity. Of the 8,065,000 bu. flax in store at the head of the lake very little is to go forward at once, and that by the American Linseed Co. alone. Other shippers are doing practically nothing as yet. There are in store and afloat at Duluth-Superior 15,496,210 bu. of all grains.

One interesting feature of the wheat situation at the head of Lake Superior now is the fact that large shipments have been made the past few days of wheat all rail to the east to mills that had bought the grain for early shipment, but have not been able to get it lake and rail, and now cannot wait longer so are paying all-rail tariffs to get it forward. Another is the entrance into the Duluth market of country mills of the northwest who have advanced the premiums on wheat on track during the past few days from 1 cent over the May price to 3 cents over. These prices were not recognized in quotations until Monday, but have been coming up for some days.

A curious lamp has been constructed by a professor in England. A glass globe placed on a metal stand is nearly filled with a liquid composed of luminous marine microbes. There are two tubes running from the globe and through these a supply of air can be sent to the interior when the light grows dull, the effect apparently being to revivify the microbes. The light from this lamp will last for several weeks without renewal of the illuminating medium.

LUMBER INTERESTS AT HEAD OF THE LAKES.

Duluth, May 10.—Meeting of the head of the lake saw mill men and the vessel interests have been held this week to adjust differences. The longshoremen working on lumber vessels want 55 cents an hour this year, which the shippers do not want to pay. The shippers want the mill men to take charge of loading and this the latter are loath to undertake. In preceding seasons they have steered clear of this entanglement. The shippers do not want to pay more than 50 cents an hour for longshoremen, and they are half inclined to refuse to treat with unions, preferring to have an open shop, so to speak. They are not so much averse to the wage scale, but they are very sore over the way union men have been working for the past year or two. A man will now load nowhere near so much lumber in a day as when the pay was 40 cents an hour. If a man now, in some temporary period of unconsciousness, picks up two strips and starts to load them at one time, the other men all shout at him and force him to drop one, making him so ashamed of himself for his remarkable and pernicious activity that he cannot get down to work again for an hour. They want some remedy for these conditions. As it seems here the difficulties with vessel unions have been adjusted and the fleets are ready to resume the lumber trade as soon as need be. There is a great deal of lumber on dock here and some local firms are very anxious to get it out of their way. They have commenced to make more at a rapid rate and piling room will soon be at a premium.

NORTHERN PACIFIC IMPROVEMENTS AT DULUTH.

Duluth, May 10.—The Northern Pacific road is planning extensive improvements to its water front property at Duluth for this year. The great work on the west side of Rice's point, commenced two years ago, will be carried forward. It is understood from very good authority that the road's large car and repair shops at Como, near St. Paul, will be wrecked and rebuilt on this ground at Rice's point in the very near future. This will be one of the most elaborate changes to be carried out and will necessitate the removal from Como of about 400 families. The new shops are planned for very large work, and will be most economically arranged, with long water front directly in the upper harbor, and with deep water along side. The yards at the same point which now have capacity for 7,500 cars will be extended. The docks of the Duluth Terminal Co., bought two or three years ago by the Northern Pacific, are to be rebuilt and filled solid. This dock is now of piling. Most of the docks of the road have already been rebuilt and filled solid.

NEW COAL DOCK AT PORT ARTHUR.

Duluth, May 10.—A few little dabs of ore have been sent to docks at the head of the lake, but this has ceased and there is no probability of railway ore schedules being in force for some time. It was the intention of many big shippers, both steam shovel and underground, to be loading by this time.

At Port Arthur the Canadian Northern is to erect a large coal dock near its grain elevator. The company will put up a large and modern dock, well equipped. Its coal business was too large last year for the temporary structure then in use. The road will be busy this year receiving and forwarding steel for construction in the northwest. It has bought a large tonnage of rails and will extend its rail receiving dock so that there ships can discharge simultaneously.

The first grain to be loaded for the season was 80,000 bu. on Saturday, May 7, on the Neepawah, at the Canadian Northern elevator. John D. Mackenzie of Mackenzie & Mann of the Canadian Northern railway, when at Port Arthur a day or two ago, stated that: "We have capacity for 7,000,000 bu. of grain here, and when the new elevators are ready can ship 1,000,000 bu. a day and receive 500 cars daily. This is larger than any other plant (in Canada). To make this plant

complete we shall erect a cleaning and drying house to be ready for the 1904 crop. It will have storage for 500,000 bu. and will be completely equipped for its purpose."

AROUND THE GREAT LAKES.

The Erie canal opened last week with no boats ready to move.

The dredges have begun work at the head of the middle ground of Black river, Port Huron.

The schooner Iver Lawson has been sold by Martin Johnson to Capt. Henry Larsen of Chicago.

Dredging in the Maumee state channel was resumed this week by the Chicago & Great Lakes Dredge & Dock Co.

The Niagara Navigation Co. will begin its regular season on Monday next with a fruit trip service each day between Toronto and Lewiston.

The steamer Martin Muller, building at the Cleveland yard of the American Ship Building Co., for Capt. Charles S. Hutchinson of Cleveland and others, will be launched Saturday morning.

Capt. Harris W. Baker of Detroit has succeeded in removing the wreck of the Glidden from the St. Clair Flats ship canal. He concluded his labor this week. The Glidden was wrecked on Oct. 9 last.

The little schooner Jessie Maggie was sunk during the severe storm near Pelee island last Monday. She had a cargo of gravel aboard. The Maggie was owned by W. J. Terrill of Cleveland and was built in 1887. The crew reached the shore in a yawl.

The City of Buffalo of the Cleveland & Buffalo Line has twenty-one more staterooms than the Eastern States and Western States of the Detroit & Buffalo Line, since her lengthening by 42 ft. She is, therefore, the largest passenger steamer on the lakes. She draws 1 ft. less water now than formerly and her speed is designed for 19 miles an hour.

OBITUARY.

Capt. John A. Larson of Escanaba died last week. He was fifty-eight years old and leaves a widow and four children.

Mr. James R. Sprinkle, one of the best-known business men of Cleveland, died at his home this week. He was vice-president of the L. P. & J. A. Smith Co. and was identified with various other enterprises. He was sixty-two years old.

John Robinson, an old marine engineer, died at his home in Detroit last week. He was eighty-three years old and had sailed on the steamers Clements, Welcome, Sweepstates, Livingstone and Thomas Adams. He was nearly eighty years old before he quit sailing.

On April 27, while conversing with an employe of the marine and fisheries, Mr. Archie Michaud, chief engineer of the Canadian government steamer Druid, fell to the ground unconscious and died within a few minutes in the shipping office, whither he had been carried. Michaud had been in the employ of the department for nearly twenty-five years; he was about forty-five years of age.

Mr. Daniel Crawford, the Baltimore ship yard worker who made such a profound impression upon the house committee on merchant marine about two months ago in Washington, died very suddenly last week in Chicago. He was returning home from Denver where he had been as a representative of the local union of boilermakers at the national convention. He was taken with pneumonia in Chicago and succumbed after an illness of three days. Mr. Crawford attracted much attention before the congressional committee because he delivered a strong appeal in behalf of the bill extending the coastwise laws of the United States to the Philippines. He said at the time that his position was unique in that representing labor he was pleading the cause of American capital, and he said that he hoped in the future he might see a better degree of co-operative spirit between them than had ever been the case.

APPOINTMENTS OF MASTERS AND ENGINEERS.

Ashley & Dustin, Detroit: Steamer—Frank E. Kirby, Capt. A. J. Fox, Engineer H. L. Lewis.

Ann Arbor Railroad & Steamship Line, Toledo, O.: Steamers—Ann Arbor No. 1, Capt. B. F. Tulledge, Engineer P. H. Doyle; Ann Arbor No. 2, Capt. F. A. Robertson, Engineer F. Russell; Ann Arbor No. 3, Capt. H. F. Rydt, Engineer F. J. Harkins.

Brainard, W. S., Toledo, O.: Steamer—Cherokee, Capt. James Mara, Engineer John Hannon. Schooner—Chippewa, Capt. John Davidson.

Bigelow Bros. & Walker Co., Chicago: Steamer—Madagascar, Capt. D. Elliott, Engineer Chas. Merriter.

Brown Steamship Co., Cleveland: Steamer—Castalia, Capt. John F. Jones, Engineer Edward Dempsey.

Becker, William, Cleveland: Steamer—Geo. W. Roby, Capt. P. Yax, Engineer F. J. Randall.

Carter, E. D., Erie, Pa.: Steamers—Luzon, Capt. A. E. White, Engineer John J. Stevens; Panay, Capt. C. H. Wilson, Engineer —.

Cleveland & Buffalo Transit Co., Cleveland: Steamers—City of Buffalo, Capt. W. H. Smith, Engineer Chas. Lorimer; City of Erie, Capt. H. McAlpin, Engineer J. Y. Rendall.

Central Canada Coal Co., Ltd., Brockville, Ont.: Steamer—Samuel Marshall, Capt. John Bouchard, Engineer R. H. Lawson.

Downey & Co., Robt., Oswego, N. Y.: Steamer—Monteagle, Capt. Geo. E. Talbot, Engineer Wm. S. Brown.

Detroit & Buffalo Steamboat Co., Detroit: Steamers—Eastern States, Capt. D. McLachlan, Engineer J. P. Wells; Western States, Capt. F. S. Stewart, Engineer A. Carter.

Detroit & Cleveland Navigation Co., Detroit: Steamers—City of Detroit, Capt. A. J. McKay, Engineer W. S. Huff; City of Cleveland, Capt. A. McLachlan, Engineer John T. Hall; City of Alpena, Capt. M. Lightbody, Engineer A. Phillips; City of Macinac, Capt. F. J. Simpson, Engineer Wm. McDonald; City of the Straits, Capt. —, Engineer —; State of Ohio, Capt. A. H. McLachlan, Engineer D. Donaldson; State of New York, Capt. Salem Robinson, Engineer Wm. Stein.

Eddy-Shaw Transit Co., Bay City, Mich.: Steamers—E. C. Pope, Capt. Wm. A. Williams, Engineer Wm. C. Anderson; Selwyn Eddy, Capt. Wm. Greening, Engineer John F. Quinn; Penobscot, Capt. Geo. C. Stevenson, Engineer Edw. A. Hoffman; City of Bangor, Capt. A. J. Mahon, Engineer John M. Conroy.

Fairgrieve, J. B., Hamilton, Ont.: Steamer—Arabian, Capt. W. D. Graham, Engineer Jas. H. Brown.

Great Lakes Transportation Co., Sheboygan, Wis.: Steamer—John Oades, Capt. R. Rieboldt, Engineer John Geminhardt.

Green, John, Buffalo: Steamer—Lewiston, Capt. Samuel Thurston, Engineer James Green.

Gray Transportation Co., Cleveland: Steamer—Arizona, Capt. Walter Neal, Engineer —. Schooners—Scotia, Capt. Wallace; Plymouth, Capt. Carl Jorgenson.

Goodrich Transportation Co., Chicago: Steamers—Christopher Columbus, Capt. Chas. Moody, Engineer Geo. McLaughlin; Virginia, Capt. Geo. Pardee, Engineer G. P. Roth; Indiana, Capt. Elmer E. Redner, Engineer Wm. Nicholas; City of Racine, Capt. John A. Wilson, Engineer Felix Neider; Atlanta, Capt. Edward Taylor, Engineer Jos. Peroutka; Iowa, Capt. John C. Raleigh, Engineer Julius Buschman; Georgia, Capt. Chas. T. Bronson, Engineer Chas. Bonn; Sheboygan, Capt. A. E. Johnson, Engineer A. Gilbraith; Chicago, Capt. Con. McCauley, Engineer Thos. E. Dorey.

Ionia Transportation Co., Detroit: Steamer—Ionia, Capt. F. C. Pratt, Engineer M. M. Hill.

Hutchinson & Co., Cleveland: Steamers—Martin Mullen, Capt. W. P. Benham, Engineer P. Lyons; J. T. Hutchinson, Capt. J. H. Smith, Engineer W. J. Swain; City of Glasgow,

Capt. Jas. Murphy, Engineer Geo. Blauvelt; Germanic, Capt. S. B. Massey, Engineer Anton Rud; Rube Richards, Capt. —, Engineer —. Schooners—Abyssinia, Capt. T. K. Woodward; E. C. Hutchinson, Capt. Wm. Kelly; May Richards, Capt. —.

Hanna, D. R., Manager Calumet Transportation Co., Cleveland: Steamers—Geo. A. Flagg, Capt. Wm. Langell, Engineer A. Romzick; R. S. Warner, Capt. Ed. Sullivan, Engineer Ed. Donaldson. Schooners—S. D. Warriner, Capt. A. McArthur; A. W. Thompson, Capt. M. Anderson.

Hanna, D. R., Manager Franklin Transportation Co., Cleveland: Steamer—W. F. Fitch, Capt. Richard O'Connor, Engineer Douglas Brews. Schooner—A. Maitland, Capt. B. W. Landfair.

Holland & Graves, Buffalo: Steamer—Mohegan, Capt. James Cunningham, Engineer Wm. Schumaker. Schooners—Mingoe and Aloha, Capt. Wm. McCarter; John A. Francomb and Annabel Wilson, Capt. James Roberson.

Lake Shore Stone Co., Milwaukee: Steamer—Hennepin, Capt. Chas. D. Ross, Engineer John W. Patterson.

McVittie, Alex, Detroit: Steamers—Senator, Capt. W. A. Irvine, Engineer W. J. Bolton; Colonel, Capt. A. Ames, Engineer A. Cobo.

Mehl, Edward, Erie, Pa.: Steamer—Uganda, Capt. W. W. Wilkins, Engineer Wm. M. Phillipie.

Meyer, W. H., Milwaukee: Steamer—Christopher, Capt. W. E. Wright, Engineer Scott Pratt.

Republic Iron Co., Cleveland: Steamers—Republic, Capt. Wm. Megarvey, Engineer Grant G. Donaldson; Continental, Capt. W. A. Black, Engineer A. Nelson.

Rhodes, R. R., Cleveland: Steamers—Yale, Capt. Jas. Jackson, Engineer H. Stone; W. C. Rhodes, Capt. P. Dowdell, Engineer Guy A. Hemenger; Huron, Capt. W. Moore, Engineer C. Folkerts; Minneapolis, Capt. Geo. W. Moore, Engineer D. J. McMillan; St. Paul, Capt. Peter Thompson, Engineer Henry Stone.

Stewart Transportation Co., Detroit: Steamer—A. E. Stewart, Capt. Fred Stewart, Engineer Robert Lacey.

Smith, Edward, Buffalo: Steamers—Thomas Cranage, Capt. John S. McNeil, Engineer —; City of Paris, Capt. J. T. Hutton, Engineer —.

S. W. Transit Co., Cleveland: Steamer—A. G. Lindsay, Capt. C. H. Woodford, Engineer John DuChene.

Seither, Frank, Cleveland: Schooner—V. H. Ketcham, Capt. Dan Wilman.

Seither Transit Co., Cleveland: Steamer—G. J. Grammer, Capt. J. A. Powell, Engineer Geo. B. Milne.

England Transit Co., Cleveland: Steamer—R. W. England, Capt. R. W. England, Engineer John Booth.

Taylor, M. H., Erie, Pa.: Steamer—Niagara, Capt. M. A. Budd, Engineer A. Turner.

Teagan Bros., Detroit: Steamers—Samoa, Capt. John B. Maddock, Engineer Jas. Bennett; H. S. Pickands, Capt. H. B. Leonard, Engineer Fred Vieau; Chauncey Hurlburt, Capt. Jos. Parsons, Engineer Mr. Potter. Schooner—D. K. Clint, Capt. Bert Peltier.

Warde, John J., Chicago: Steamer—Niko, Capt. Thos. Biggs, Engineer John Collins. Schooner—Annie M. Peterson, Capt. Chas. Bough.

White Star Line, Detroit: Steamers—Tashmoo, Capt. B. S. Baker, Engineer Winfield Dubois; Greyhound, Capt. Thos. Meikleham, Engineer David Maxwell; City of Toledo, Capt. John J. Stover, Engineer Michael J. Gilligan; Owana, Capt. Timese Lemay, Engineer Chas. H. McCarten.

It was announced last week at the United States engineer's office in Chicago that the proposed turning basin to be built on the north and south branches of the river would not be in shape for use by steamers this season. The proceedings have gone so far as to condemn the sites.

MARITIME ASSOCIATION AND ITS OFFICERS.

With a membership of 1,045 the Maritime Association of the Port of New York began its thirty-second year of existence on May 1, having been organized in 1873 and incorporated in 1874. In 1875 it absorbed the old Merchants' Exchange and News Association, and has ever since been the representative of the maritime interest of the port of New York, and to a large extent of the whole nation, through New York's supremacy as a commercial center.

In the first years of its existence its membership was made up of firms and companies, whose representatives upon the floor of the exchange they might change at pleasure, but its certificates of membership are now issued to individuals only. Marine insurance companies, steamship and transportation companies, vessel owners and agents and all who are engaged in the management, construction, repair, outfitting and supply of vessel property are represented in its membership and contribute to its support, receiving in return many advantages derived from a community of interest and a full and prompt distribution of marine news. The gathering and dissemination of the latter is one of the most important branches of the association's work, necessitating a corps of correspondents throughout the world and a close connection with the

various exchanges and news centers of the country, and the prompt and accurate reports which it furnishes of disasters, marine miscellany and arrivals and departures of vessels are absolutely essential to the underwriters and steamship agents, and various maritime interests for whom the exchange was established and is still primarily maintained. Its membership is no longer confined entirely to these interests, however, its various facilities and financial and commercial intelligence having attracted to it bankers, merchants, dealers in domestic and foreign produce and commercial houses in general business. The rooms of the association are, by its charter, designated the Maritime Exchange.

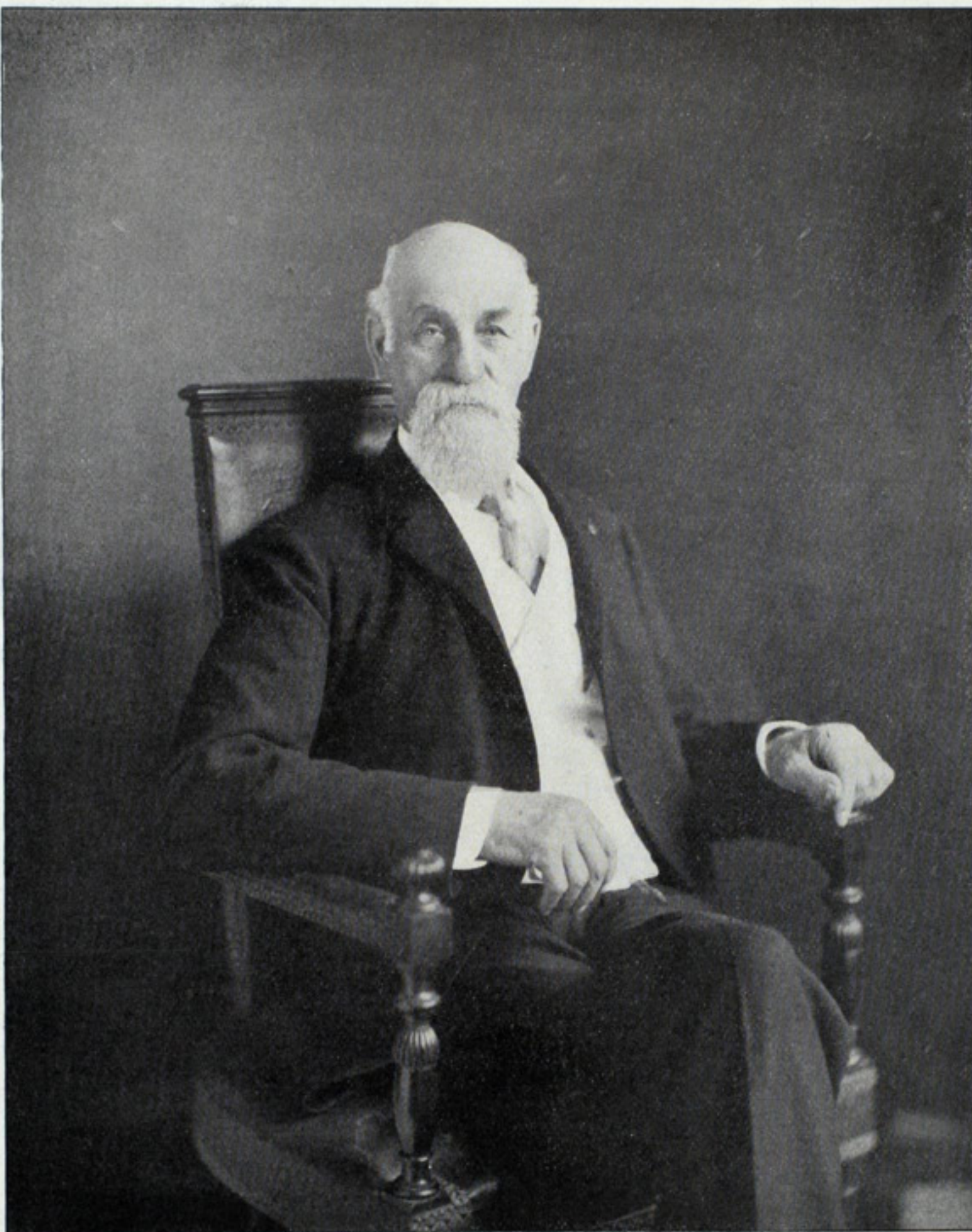
The association has been instrumental in the passage of many important measures by the national and state legislatures in the interest of navigation and commercial affairs. It favored ample appropriations to maintain the efficiency of the United States signal service; the improvement of Gowanus bay channel in New York harbor; a harbor of refuge at

Point Judith, R. I.; the maintenance of ocean mail service by American vessels; the licensing of seamen's boarding houses. It also opposed congressional and legislative bills proposing to subject sailing vessels to inspection by inspectors of steam vessels, and giving to those officials the management of all seamen; also the repeal of the law exempting New York vessels from state and local taxation; establishing a system of international buoyage, etc. Of late it has been active in support of the movement to establish and maintain a vessel

designed to cruise in search of derelicts and destroy or tow them to harbor.

On Jan. 5, of the present year the association moved into its new home at 78-80 Broad street, the property having been purchased by the association about a year previous, and a modern office building erected, with a commodious and handsome exchange room on the ground floor. The event was signalized with a banquet at which many prominent officials and public men attended and made addresses.

Capt. Parsons, who has, after most ridiculous opposition, been re-elected president of the Maritime Exchange, has been a member of the exchange for about sixteen years, since his retirement from the active command of his own vessel in the late '80's. He has been a member of the board of directors for about seven years, has served on a number of committees, and has three times



CAPT. PARSONS, PRESIDENT MARITIME ASSOCIATION, PORT OF NEW YORK.

been elected president of the association.

In 1861 Capt. Parsons enlisted in the Union army, as a private and when mustered out, at the close of the war, and after four years of hard campaigning, he had the rank of captain and brevet major, and was chief engineer of an army corps. Before the war Capt. Parsons had chosen the sea for his career, and after its close he resumed it, remaining in command of his own vessels, built by himself in Pennsylvania and Maine ship yards, for some twenty-five years. Since that time he has been actively engaged in the management of vessel property, including that in which he has a direct personal financial interest.

Capt. Parsons has for a great many years been prominently identified with religious work, and particularly in the line of Sunday school affairs, having been at the head of the New Jersey Sunday School Association for three years and has been a long time identified with the International Sunday School Association. He was born in New Jersey in 1835,

and his home has always been in the state and county in which he was born. He is a resident, at the present time, of Red Bank, Monmouth county, N. J., where he has been prominent in its local affairs. In politics he is a Republican.

A year ago Capt. Parsons was appointed a member of the New Jersey State Board of Pilots by Gov. Franklin Murphy of that state, a position to which he is peculiarly fitted through a long and active career as ship master and navigator of the port of New York and most of its tributaries.

During his two years as president of the Maritime Exchange Capt. Parsons has devoted a large portion of his time to its affairs. He carried to successful accomplishment the construction of a building of its own, located upon the same block that its quarters had been for twenty-one years preceding its occupancy of its own building, and the building which the



MR. C. R. NORMAN, VICE PRESIDENT MARITIME ASSOCIATION.

Maritime Exchange formerly occupied so long is now connected with the floor of the Maritime Exchange through the latter's rear entrance, so that, so far as the convenience of members is concerned, the change has been eminently satisfactory. The purchase of the site, and the construction of the present building, involving an expenditure well above \$300,000, has been one that has called forth painstaking effort and large responsibilities, to which Capt. Parsons has responded loyally, and wholly in the interest of the exchange and its membership.

Capt. Parsons is reluctant to talk about the recent contest for the election of officers, and deprecates anything that will have the least tendency to widen any possible breaches between members. His chief aim is to have the members satisfied with their exchange and benefited by its work, and he will be most happy if he is able to increase its membership, its usefulness and its influence for the good of its members and for the port of New York. To that end he most heartily invites the co-operation of all members.

Mr. C. R. Norman holds an important position with the



MR. JUSTUS RUPERTI, TREASURER MARITIME ASSOCIATION.

Tidewater Oil Co., a subsidiary company of the Standard Oil Co. He has been vice president for a number of years.

Mr. Justus Ruperti is connected with the firm of G. Amsinck & Co., steamship agents, one of New York's oldest shipping firms. Mr. Ruperti has served one year as a member of the board of directors of the Maritime Association and was unanimously elected as its treasurer.

PERSONAL.

President W. L. Brown of the American Ship Building Co. has returned to Chicago from a winter's sojourn on the Pacific coast.

Gen. George W. Davis, a member of the Panama Canal Commission, has been appointed governor of the American zone on the isthmus by President Roosevelt.

John Findley Wallace of Chicago, general manager of the Illinois Central railroad, has accepted the position of chief engineer of the Panama Canal Commission at the solicitation of President Roosevelt.

Capt. Thomas McDermott of Tonawanda will celebrate his eightieth birthday on May 18. He is probably the oldest captain on the great lakes in active service. He still sails the schooner C. H. Burton.

Mr. A. B. Polson and Mr. J. B. Miller of the Polson Iron Works, Toronto, have been in Great Britain looking over the ship yards for new ideas. Mr. Polson expresses the hope that in the future Canada will build her own turbines.

The steamboat James Dietrick, built for the United States & Nicaragua Line by the James Rees & Sons Co., was launched at Pittsburg this week. The steamer, which is complete in every respect, will leave this week for the Coco river, Northern Nicaragua.

The Toyo Kisen Kaisha Line has announced that it will abandon its steamship service between San Francisco and the orient until the close of the Japanese-Russian war.

YACHTING ON THE CLYDE—SHIPPING IN SCOTLAND.

Glasgow, May 2.—As I desire to vary the interest of these letters as much as possible I venture this week a few remarks on yachting affairs, in which the Clyde takes a leading part.

It is said here that no season within the past two decades has been approached in such a pessimistic mood as that which now pervades the yachting circles of the Clyde, and there is no consolation in the knowledge that in the south they are as rueful as ourselves. It may turn out that the pessimistic apprehensions were not wholly justified, but for the moment there seems to be no way of escape from the conviction that British yachting is in a somewhat backward state.

The proofs of it consist not so much in the almost total disappearance of large-class racing—which is frequently and erroneously taken as a criterion of the condition of the sport—but in the lax personal interest shown by the general body of yachting men themselves. It is attributed by the yachting expert of the Glasgow Herald to the Y. R. A. and its regulations, which do not sufficiently guard and encourage the proper type of yacht, that will be best and cheapest and strongest and safest and longest lived. The rich man is warned that the luxurious steam yacht, and the inordinately expensive cutter towing astern, are crushing the spirit out of those of more moderate means, who are being forced out of the sport by their poverty. Clubs and their officials are wrong frequently in their principles and methods of conducting regattas, and are asked to consider their position before it is too late. There may be a grain of truth in some or in all of these expostulations, but we have to look elsewhere for the real seat of the trouble, which is, after all, not far to seek. In the turn of the cycle we

have been cooling down from the enthusiasm of some years ago. By the close of the present, or at latest next, season we shall probably have reached our lowest and most apathetic point. Then, naturally, the course of events will have an

upward tendency, and the periodic boom which nothing can hinder will make the sport hum again. Even now one may notice some latent signs of an approaching revival. Had Shamrock III been a successful challenger, that would have precipitated a return to prosperity and the height of competitive racing. Perhaps it may prove a more lasting benefit that things should mend and increase in the ordinary course, and without adventitious impetus.

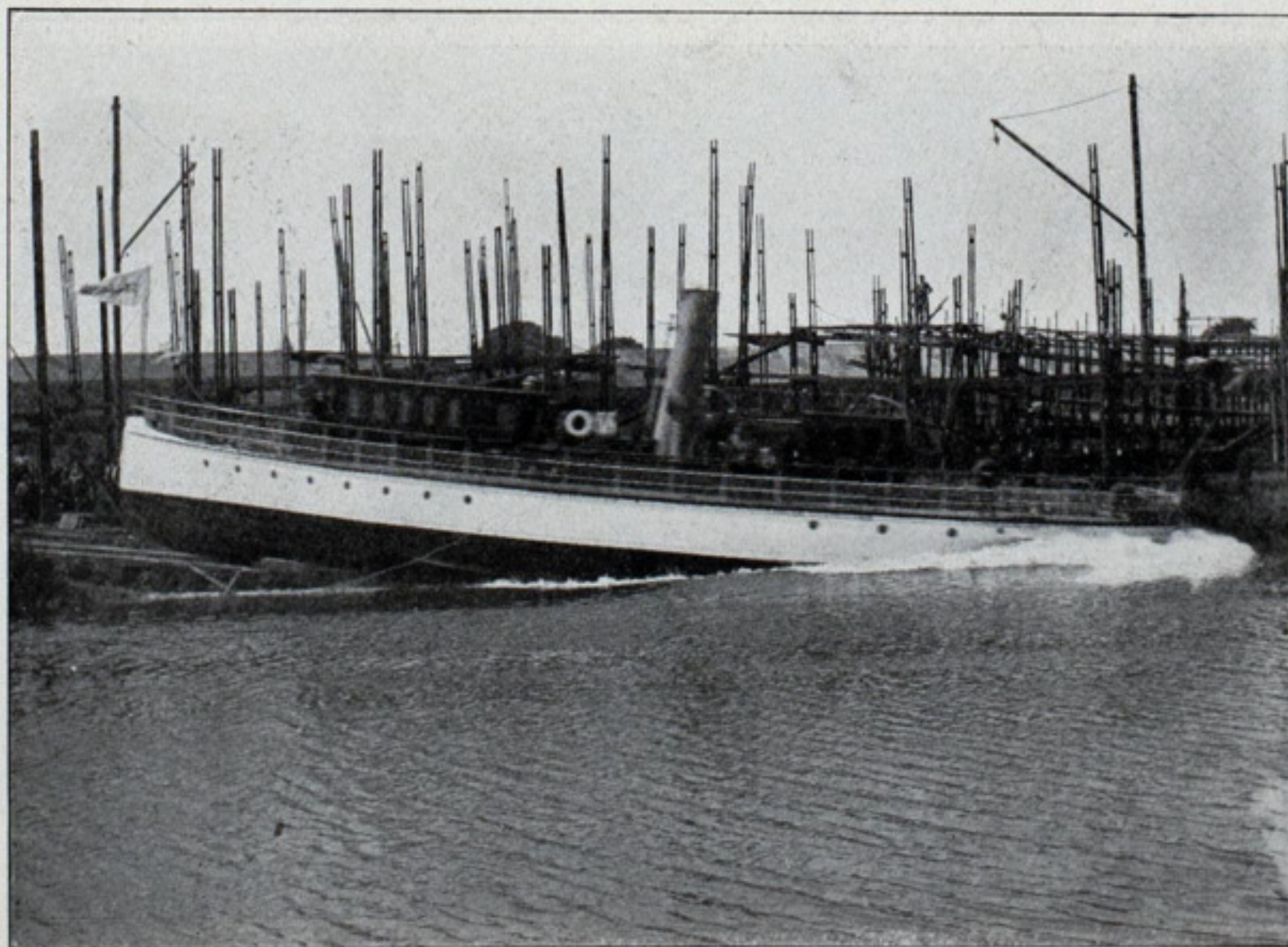
While there is for the time a reluctance to carry

on the larger classes that have popularized the racing at all the regattas round the British coast, the Clyde is in the position of being able to boast that no similarly declining spirit has been shown in relation to the smaller raters that have proved the nursery of our numerous clubs. So far as the big handicap yachts are concerned, it is all but hopeless to look for anything beyond the meagerest representations. Several vessels that were wont to grace the more important occasions have been sold elsewhere or are now on the sale list. Valdora and Bona will hardly remain long on the Clyde after

completing their outfit, and if rumor proves true Carina may be induced to go south also. Of the 52-ft. class, the boats will be racing on the Clyde during the "Fortnight" (in July) and no longer. The formation of a purely Clyde Y. R. A. 52 ft. or 42 ft. class has been suggested but as yet without encouraging response. The leading class will, therefore, be that of the 42-foot handicappers, to include Mirza, Verne, Coila and Kelpie, and a few of the smaller boats that come in



CRUISING OIL LAUNCH DECKED ALL OVER WITH SMALL CABIN FORWARD. DIMENSIONS, 42 FT. LONG, 8 FT. BEAM AND 4 FT. DEEP. FITTED WITH A 20 B. H. P. OIL MOTOR USING KEROSENE OIL.



TWIN-SCREW STEAMER SEABREEZE, BUILT FOR ANDREW CARNEGIE, SKIBO CASTLE, SCOTLAND, FOR SERVICE ON THE NORTH COAST OF SCOTLAND. DIMENSIONS, 81 FT. LONG, 16 FT. BEAM AND 8 FT. DEEP.

with that lot. The 36-foot class, which last year included such smart raters as Falcon, Ensay, Barabel, and Eileen, will make no appearance, but a renewal of interest in the Clyde 20-tonners will partly atone for the absence of the 36-footers. If all goes as foreshadowed, the class is likely to be about as strong and as full of life as in the year of its inception. The most cheering fact of the year is the formation of the new Y. R. A. 30-ft restricted class, intended in a way to supersede the good old 23-footers, which have had their day, and a most serviceable class they proved. A proposal to form a handicap class to consist exclusively of ex-23-footers is being received with general approval. When this has been agreed upon, there will not only be these 23-footers racing amongst themselves on small handicap allowances but the ex-old-rating class will be left free to the other small cruisers that could boast no 23-foot connection, so that the competition will proceed on a basis of greater equality. No other changes of importance in the classification of the smaller classes are contemplated as these will turn out on lines much similar to those of last season. Although there has been little of an outstanding character in the run of new orders, both designers and builders have been pretty well employed in the winter months. From a local point of view, the building of the new 30-foot class has the most important bearing upon the forthcoming season. The class was promoted with an encouraging energy, and very soon owners were to the front with the new boats. The class is a restricted one on 30-ft. Y. R. A. linear rating; its formation has been received with general approval from yachtsmen in the south as well as here and the hope has been expressed that it will form the nucleus of other restricted Y. R. A. classes on the Clyde and elsewhere. One satisfactory feature about the class is that it is not on the one-design principle, of which the Clyde has had of late as much as will suffice for a considerable period. The regulations of the new



TWIN-SCREW PASSENGER STEAMER CALEDONIA, WITH ACCOMMODATIONS FOR 150 PASSENGERS. DIMENSIONS 80 FT. LONG, 14 FT. 6 IN. BEAM AND 8 FT. DEEP.

[Built by Bow, McLachlan & Co., Paisley.]

of the balanced rudder type, and to be hung on the stern-post; ordinary working anchor and chain to be on board when racing and when measured; two fixed platforms or seats at least 7 ft. 6 in. long, and all floors and platforms must be in position when racing; rig to be cutter-mainsail, topsail, and two headsails; area of mainsail not to exceed 62 per cent. of the total sail area; no time allowance; yachts not to be docked or hauled up on shore except for the purpose of repairing damage more than once in fourteen days. The other new work has but slight relation to sport on the Clyde. The biggest contract is that for the building of the large yawl by A. & J. Inglis, for Herr Oscar Huldshinsky of Berlin, to the design of Mr. Wm. Fife. On the ability of this yacht British sportsmen rely to defeat the American schooner Ingo-mar, which is coming over in charge of Capt. Charles Barr to race for the Cape May Cup, now held by Britannia, and to secure as many other trophies in British and German waters as can be won.

The improvement in the ship building position continues al-

though not so many new contracts are being booked this month as last. There is, perhaps, some exaggeration in current gossip as to the number of new vessels actually booked since the New Year, but then the contracts reported do not by any means cover all the bookings. Many builders do not care to show all their hands. Still, the business is very unevenly divided especially in Scotland, and some builders have a poor prospect before them. In a recent letter I gave



STEAM YACHT ILONA, 74 FT LONG, 13 FT. BEAM AND 9 FT. DEEP, FOR SERVICE IN SCOTLAND.

the tonnage output of Scotch builders for the past quarter as 102,400 tons, and said that the new contracts booked in the same period amounted to 132,190 tons. According to Lloyd's quarterly returns, of which you have doubtless received a copy, the merchant vessels "under construction" in the Glasgow and Greenock districts are of 294,104 tons, but "under construction" in Lloyd's classification does not necessarily mean vessels actually on the stocks. Some of that total has been already enumerated in the launches I have recorded. Again, Lloyd's total will include of new contracts only such as had been actually laid down during the quarter, whereas there were many bookings in March on which the preparatory work was not begun until this month. The above figures refer to merchant craft alone. Of warships there are 81,700 tons in addition "under construction" on the Clyde, which is about one-third of the naval tonnage under construction in private yards in the whole kingdom, including 36,770 tons for foreign navies. The Clyde warship tonnage at present is all British. Of merchant vessels the tonnage shown by Lloyd's as under construction on the Clyde is 13,753 tons less than at the corresponding date last year, but 35,000 tons more than at 31st December last.

William Hamilton & Co., Port Glasgow have launched a handsomely-modelled four-masted sailing barque of about 3,200 tons gross, the second of two sister vessels built for G. J. H. Siemens & Co., Hamburg, for their nitrate of soda trade. The vessel, which has a length of 30 ft. between perpendiculars, a beam of 47 ft. and a depth of 28 ft. to main deck has a short poop, a bridge house amidships, and a top-gallant forecastle, and is classed at the Germanischer Lloyd's under special survey. Special attention has been paid in the design to the minimizing of labor, and, with this end in view, the vessel is fitted with halyard winches, brace winches, shed winches,

and capstans for working of sails, and is further supplied with one 6 H. P. and one 10 H. P. petrol winch. The "Kurt" will be engaged in the trade between South America and Germany.

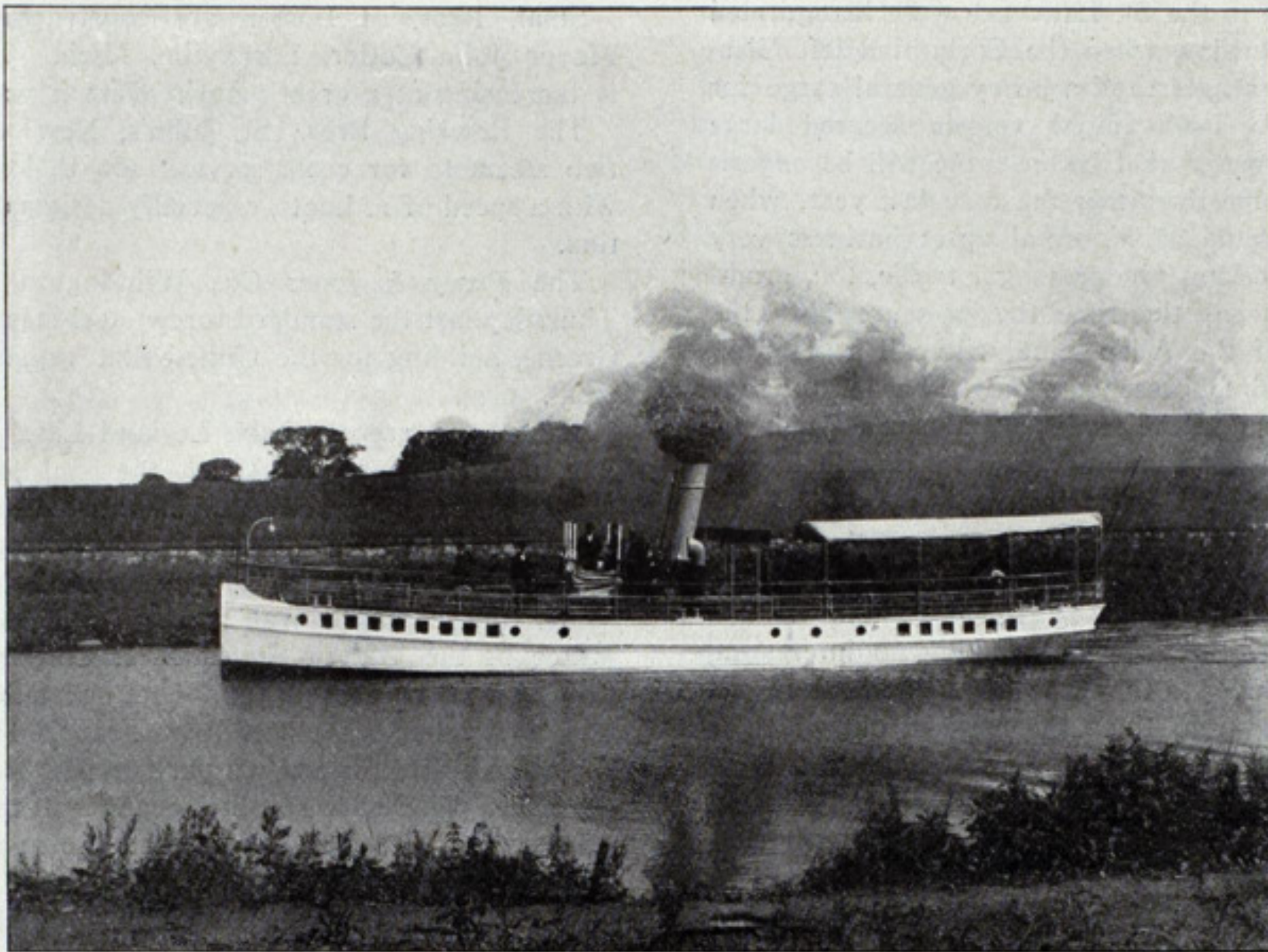
Ramage & Ferguson, Ltd., have just launched a steel screw passenger and cargo steamer to the order of the Borneo Co., Ltd., London, for their trade between Singapore and Sarawak. The principal particulars of the vessel are: Length 230 ft.,

breadth 34 ft., and depth 15 ft. 10 in. The propelling machinery consists of triple-expansion engines with cylinders 18 in. 30 in. 49 in. diameter, by 33 in. stroke, steam being supplied from two single-ended boilers working at 170 lbs. pressure. The vessel has large passenger accommodation for both European and Oriental passengers. The Kuching is the third steamer built by Ramage & Ferguson for the Borneo Co., all for the same trade.

The Belgians have decided to add three turbine mail packets to their Dover-Ostend service instead of one, as originally proposed. The turbine engines are to be constructed in Britain and the vessels in Belgium. The vessels are expected to do the passage of 52 miles in about 2 hours and 20 minutes. The cross-Channel turbine steamer Queen, after being overhauled, has again been put on the ten o'clock service, and made a record passage from Calais to Dover in 53¾ minutes.

The departure of the Donaldson Line steamer Salacia from Glasgow for Montreal was the occasion of much interest, many people being at the quay to witness the first sailing of the season. This vessel had her saloon accommodation fully occupied and her holds filled with valuable general

merchandise. Whisky formed a large item, about 14,500 cases and several hundred barrels being shipped. She also carried a number of pedigree stock—horses, milch cattle, and pigs, the latter, it is said, being from the model farm of an ex-Prime



STEAM YACHT COUNTESS OF CADOGAN FOR SERVICE ON THE RIVER SHANNON IN IRELAND. 72.8 FT. LONG, 14 FT. BEAM AND 7 FT. 9 IN. DEEP.

[Built by Bow, McLachlan & Co., Paisley, Scotland.]



PASSENGER SCREW STEAMER LADY BETTY BALFOUR, BUILT FOR SERVICE ON THE SHANNON, IRELAND. DIMENSIONS, 72.8 FT. LONG, 14 FT. BEAM AND 7 FT. 9 IN. DEEP.

Minister—being housed on her cattle deck. The Allan Line steamer *Corinthian*, which followed for Quebec and Montreal, has been the centre of great activity recently, numerous loading squads being engaged stowing away her large cargo, and tradesmen busily employed fitting up the accommodation necessary for the large booking of passengers. Cargoes for the Dominion are reported as coming forward in large quantities, and the immediately following steamers of the local lines are said to be already well booked. The Allan Line sailings from the Clyde to the St. Lawrence were inaugurated for the season last Saturday, when the *Corinthian* left Glasgow with about 700 passengers and a heavy general cargo for Quebec and Montreal. Both initial vessels secured large cargoes, and it is anticipated that better trade will be experienced both out and home than was the case last year, when the longshoremen's dispute at Montreal upset business very much in the opening weeks. The passenger traffic, too, promises to be heavy. During the time the pressure lasts the New York steamers of the Allan Line will call at Halifax for the purpose of landing passengers only. Larger tonnage will be engaged this year in the trade, Donaldson's *Parthenia* and their new twin-screw steamer *Athenia* making their first appearance on the route.

Any device in seafaring engineering has interest for you. A notable one in a small way is in connection with the West Highland fleet (originally started by Burns of the Cunard Line), of MacBrayne & Son who are making an interesting experiment with two steamers they are having built at Inglis' yard. They are putting into them the engines out of their old *Flowerdale*, which is being broken up. The new boats are single-screw, and the *Flowerdale* was twin-screw, and as the latter's boilers and engines are nearly as good as new, having been fitted only about two years ago, they are thought to be very suitable for the new vessels. The *Flowerdale* was originally the salvage steamer *Recovery*, hailing from Dover. Thus one old boat engines two new ones.

At a meeting of the Institution of Civil Engineers, Mr. E. W. De Russett read a paper on recent developments in cargo and intermediate steamers, in which he pointed out that British superiority in the matter of ship building is remarkable in spite of keen competition. As an example of what a modern cargo steamer can accomplish, he mentioned a vessel of 6,000 tons deadweight, which made thirty-six voyages of about 55,000 miles in 11 months and 19 days, carrying and discharging a total of 210,600 tons.

Of six vessels chartered by the British government for the shipment of Chinese coolie labor to South Africa for employment at the Transvaal mines, four were built on the Clyde, and one is Glasgow owned. The *Swanley* and *Cranley*, sister ships, were launched last year by D. & W. Henderson & Co.; the *Indravelli* was built in 1897 by C. Connell & Co.; and the *Tweeddale*—belonging to Mackill & Co., Glasgow—was turned out from Russell & Co.'s yard at Port Glasgow last year. The other two vessels chartered—the *Irada* and *Courtfield*—were built at Belfast and Stockton respectively.

The steam yacht *Anona*, built for Paul J. Rainey of Cleveland, a member of the New York Yacht Club, was launched last week from Lawley's Ship Yard, Boston. The yacht was christened by Miss Ethel Chapin of Providence, R. I., who broke the customary bottle of champagne as the yacht glided down the ways. The *Anona* was designed by Fred Lawley and was built by the Lawley Corporation. She is plated with steel on the raised and sunken system. She is 138 ft. over all, 110 ft. water line, 17 ft. 6 in. beam and 10 ft. 10 in. deep. She has a triple-expansion engine with cylinders 10, 15 and 24 in. diameters by 14-in. stroke, designed to give her a speed of 12½ knots an hour. The yacht is most beautifully fitted up throughout and is intended for cruising in New York waters and in Long Island sound.

ITEMS OF GENERAL INTEREST.

The Turkish cruiser *Medjidia*, built at Cramp's, stranded at Mitylene last week.

There are indications of an early settlement of the differences existing between officers and employes of the Fore River Ship & Engine Co., Quincy, Mass.

Work is progressing rapidly upon the battleship *Georgia* at the yards of the Bath Iron Works, Bath, Me., and it will probably be launched some time next week.

Small Bros. of Boston are constructing a 21-footer for Mayor John Cotter, Essexville, Mich. This class of yacht is increasing at a great rate in Detroit waters.

The Bowring Bros., St. John's, Newfoundland, will build two steamers for coast service, 200 ft. long and 31 ft. deep, with a speed of 12 knots, especially designed for winter navigation.

The Pusey & Jones Co., Wilmington, Del., launched on Thursday last the standard screw steel steamer *Gen. Nathaniel Greene*, building for the United States quartermaster's department.

The annual report of the Leyland Line, which was the first line to be purchased by Mr. J. Pierpont Morgan as a preliminary of the shipping combine, has just been made public. The directors say that after drawing \$1,347,500 from the reserve it is only possible to pay the preferred dividend for six months.

Mr. Charles M. Schwab has resigned from the finance committee of the United States Steel Corporation. Mr. Henry Phipps, who succeeded John D. Rockefeller on the board of directors, takes his place. Mr. Francis H. Peabody has resigned as a director and his partner, Mr. Robert Winsor, takes his place. There are no other changes in the personnel.

Edward C. Bryan has launched the 21-ft. yacht *Eyota* for Kenneth Stevenson of the Detroit club. The *Eyota* was designed by Burgess & Packard of Boston. Her dimensions are as follows: Length over all, 35 ft. 11½ in.; water line, 21 ft.; beam at water line, 10 ft. 5 in.; extreme beam, 10 ft. 8 in.; depth, 3 ft. The yacht is of the compromise keel and center-board type.

A dispatch from Vineyard Haven, Mass., says that the propeller *Georgetown* on her way from Portland, Me., to Philadelphia run ashore off Hedge Fence shoal during a heavy storm. The *Georgetown* is owned by George L. Crosthwaite of Buffalo. She was built at the Buffalo Dry Dock Co.'s plant in 1900. She is a steel steamer 434 ft. long, 43 ft. beam and 15 ft. deep.

Gov. Odell has accepted the resignation of State Engineer Edward A. Bond of Watertown, N. Y., who was recently appointed as chairman of the Canal Advisory Commission, and will have supervision over the enlargement of the Erie canal. Mr. Henry A. Van Alstyne of Columbia county, New York, at present division engineer of the eastern division, will be appointed to succeed Mr. Bond.

The Montreal Harbor Commission has let the contract for the construction of fourteen permanent freight sheds on the wharves of Montreal to Peter Lyall & Sons for \$2,305,000. The sheds will be built in three groups; the first group of four sheds to be begun at once; the second group of five sheds to be begun on Oct. 15 next, and the last group of five sheds to be begun on Oct. 15, 1905, and concluded on May 1, 1906.

It is announced that commencing with May 20 the *Unione Austriaci Di Navigazione* will run passenger steamers on a two weeks' schedule from Austria Hungary to New York. The rates will be a trifle lower than those of the Cunard Line with whose recently inaugurated service from Trieste and Fiume this company is evidently desirous of competing. The *Unione Austriaci Di Navigazione* will be represented in the United States by C. B. Richards & Co., New York.

Plans are being perfected for a motor boat show in the world's fair at St. Louis this summer. Over 20,000 ft. of floor space in the transportation building has been set apart

for the purpose and the leading motor boat manufacturers of the country will be represented. The variety of motor and power boats displayed will undoubtedly be the best collection of these popular boats ever brought together, including the best model of fast racing boats as well as cruising craft. The show will be managed by Dr. Robert Taylor, who had charge of the motor boat show held in New York last January.

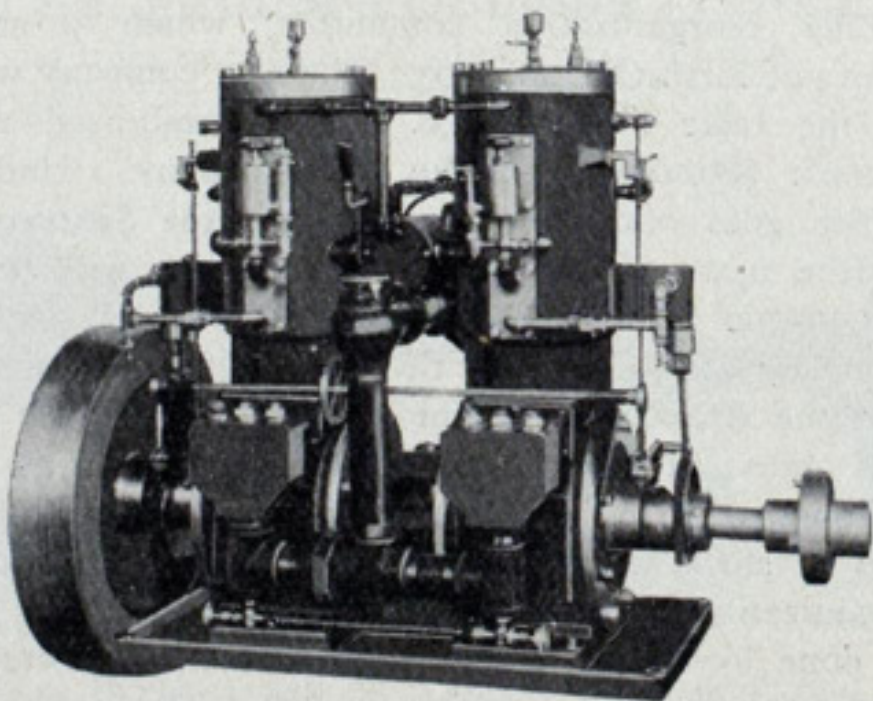
EXCELSIOR YACHT, LAUNCH & ENGINE CO.

The Excelsior Yacht, Launch & Engine Co., has secured the river front property and pier at the foot of Cooper street, Camden, N. J., (nearly opposite Market street, Philadelphia), where a "boat shop" has been erected and equipped with the most modern tools to be had and manned with the best workmen obtainable. There is ample water frontage, and it is the purpose of the company to establish a launch stable, so to speak, where users may run in, jump on dock, and leave it to the attendants to care for their boat. A phone message will cause a customer's boat to be gotten ready to start so that all you have to do is step in and be off, either from the company's pier or any point in Philadelphia. The new company has secured the services of Messrs. Matteson & Drake, naval architects and consulting engineers of Philadelphia. Mr. Drake will design and supervise construction of hulls and Mr. Matteson will look after the designing, construction and installation of the propelling machinery. Mr. Vanderslice will superintend the shop. The company will construct and maintain on the river a "compromise launch," that is to say a launch built for both comfort and speed, 36 ft. in length and 7 ft. beam, and equipped with sufficient power to make at least 15 miles an hour. Their expert will criticise and investigate motors when requested to do so by purchasers and gladly install the one selected, no matter by whom made. Buying, selling, exchanging, repairing, painting and storing in winter will follow as a matter of course.

BENTON GASOLINE ENGINES.

Thomas P. Benton & Son, LaCrosse, Wis., maintain that the only power to consider for a launch, whether used for pleasure or work,

until the extremely large sizes are reached, is a gasoline engine. Their engines are all vertical. They are of the two cycle type, which receives an impulse at every revolution,



BENTON GASOLINE ENGINE.

enabling them to give the greatest amount of power within a small space with the least weight. They represent that the cost of operation will not exceed one and one-half cents per hour per horse power. The cylinder of the engine and the base forming the crank case are cast in one piece, thus insuring rigidity of the working parts. The shaft is forged of the best steel, is of ample size, and runs in phosphor bronze shells. The crank bearing is also of phosphor bronze. There is a removable plate on the side of the crank shaft case giving ready access to the crank. The cylinder head is fitted and ground, and can be removed and replaced, if necessary, without bothering with packings. The water-jacketing of the cylinder is sufficient to keep the cylinder cool to insure proper lubrication. A gas engine is a

heat engine and water-jacketing more than is necessary to keep the walls of the cylinder cool enough so the oil will lubricate, is detrimental. It reduces the power of the engine and makes it less economical. The engine exhausts into the muffler, which is shipped with each machine. It occupies but a small space and the report is scarcely greater than the exhaust from the steam engine. The engines are thoroughly finished both in the working parts and on the exterior.

WORK AT NEWPORT NEWS.

Newport News, Va., May 10.—Unusual interest is attached to the preparations already going forward for the launching of the battleship Louisiana, which is now being raced to completion at the yard of the Newport News Ship Building & Dry Dock Co. against the battleship Connecticut, building at the Brooklyn navy yard. The unofficial competitive test involved in the simultaneous construction of these two great fighting machines is engrossing the attention of ship builders and naval men throughout the country. If the effort now being made on the Louisiana is sustained the big warship will be ready to go overboard late this summer or early in the fall. Boilers for the Louisiana are now being shipped from Bayonne, N. J., where the plant of the Babcock & Wilcox Co. is located. Parts of these boilers will be installed before the ship takes to the water and the remaining parts are to be added when she is afloat. The boilers of all the ships building at the yard at present are made by the same firm, excepting those of the Virginia, which are of the Niclausse pattern.

The Hampton Roads Boat Building Co., an independent concern, whose plant adjoins that of the big Newport News company, and which is largely backed by local capital, has completed its buildings and installed most of the machinery required at this time. The first work was started this week. From now on the force of workmen in each department will be regularly employed, their numbers being augmented from time to time as the business increases. The sliding ways have not yet been completed but will be ready in time for the first launching. Piers will be built out into the water and a solid breakwater will extend from the end of the upper pier in the direction of the shipyard, which, with the protection now afforded by the shipyard piers, will make an excellent harbor for small craft. The company is also preparing to dredge in front of the ways, so as to permit vessels of from 6 to 8 ft. to come up to the ways.

The Newport News yard has been advised to the effect that the battleship Missouri, which was damaged several weeks ago by the terrible explosion which cost the lives of thirty men, will arrive here in a few days for general repairs. Only the turret in which the explosion occurred was seriously damaged.

TRADE NOTES.

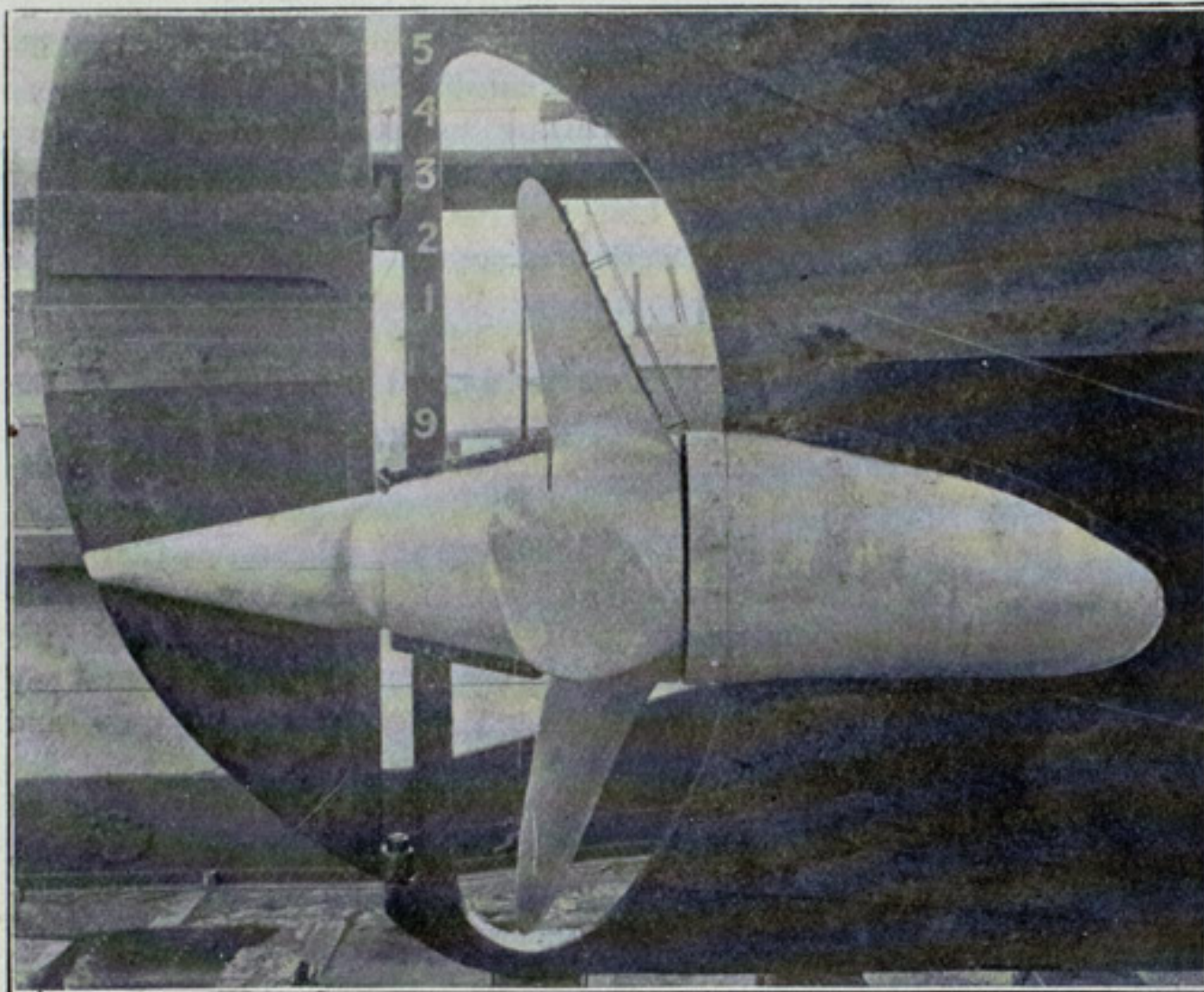
The Fort Wayne Electric Works, Fort Wayne, Ind., have just issued two bulletins, one devoted to the single phase integrating induction type K wattmeters, and the other to small rotary transformers self exciting alternators and motor generator sets.

The rapidity with which the Allen portable pneumatic riveting machines can be operated and do good work is shown in the claim of the manufacturer, John F. Allen, 370-372 Girard avenue, New York, that the Allen compression lever riveter will drive 175 rivets in five minutes.

The Crandall Packing Co., Palmyra, N. Y., has just issued a price list catalogue devoted to steam, ammonia and hydraulic packings manufactured solely by this company. The catalogue is carefully arranged and is very compact. Every detail is carefully indexed so that any desired information may be obtained at a moment's notice. The company says that it has had over twenty years' experience in furnishing packings and that with the latest improved machinery and skilled labor it is enabled to fill all orders with dispatch and economy.

WALTERS' SCREW PROPELLER IN BRITAIN.

Liverpool, May 2.—In British mercantile marine circles just now, there is much attention being paid to the problem of marine propulsion by screws, and improved propellers are frequently making their appearance with claims of superiority that are not always substantiated when put to practical demonstration on some merchant ship in her usual course of trading. There is, however, one of them which, on account of the results already achieved, and the excellent reports which have been made upon it by ship owners and superintending engineers, I have thought worthy of notice and illustration in the pages of the Marine Review. It is the patent of Capt. W. M. Walters of Walters Propeller Co., Liverpool, and is believed by experts to be the highest development to which the single



WALTERS' SCREW PROPELLER

screw propeller has yet attained. The inventor has arrived at the conclusion that the middle third of a propeller is not only useless but mischievous. As the blade theoretically starts from the center of the shaft where it is immediately fore and aft and of no possible value and twists in following the true pitch line until it attains an angle at the tip of about 70° to the keel line, it seems obvious that until it reaches an angle of 45° it must be pushing water more sideways than aft and is consequently not giving back speed commensurate with the power put into it. The best part of the propeller must be the part that thrusts most directly aft and by its reflex action puts most effort on the thrust block. This of course is the tip, and the best propeller must be the one which gets the power of the engines most on the end of the blades. To achieve this result Capt. Walters, in his invention, cuts out the whole middle third or so of the propeller by the extension of the boss, and starts the blade from the boss at the dead neutral point, by which means he practically eliminates not only the center third, but the center half of the propeller and works with the tips only in blue solid water. Having now the large boss, it remains to take the drag off it. This he does on the foreside by a light casing of the same diameter as the boss, and running forward till it meets the ship's lines—built into a new ship—and on the afterside by a long cone extending from the back of the boss to the end of the rudder. It is clear that once the cone passes the rudder post, either the rudder must be cut to let it pass over the cone, which is inadmissible for many reasons, or a joint must be put into the cone. He prefers the latter, and consequently the cone consists of two parts, a hollow shape or socket securely fastened

to the rudder post, and a tail piece bolted to the rudder with a ball on the foreside working loosely into the socket. By this device he claims to get the power of the engines and the center of effort further out on the blade than anything else possibly can. In doing so he makes a flywheel of the boss, and afterwards takes the drag and suction of it. As regards ships fitted with this new propeller, exhaustive trials have been made by steamers owned by Messrs. Furness, Withy & Co., West Hartlepool, the Gulf Line, and the steamship Zeonian, improved speed being obtained in each case of from half to three-quarters of a knot. In all cases the coal consumption has been the same or less if anything, and no difficulty whatever has been experienced in getting the various propellers off and on. Further the stern bush in each case has been found to be worn down less than 1/8 in. and everything else absolutely intact. Capt. Walters does not look for a broken tail end shaft where his propeller is used, for the reason that he gets half to three-quarters of a knot more speed out of a given horse power, because his propeller thrusts harder endways on the shaft, and as he does not manufacture power, he can only take it from the side thrust, thereby reducing the torque to that extent. What, in his opinion smashes tail shafts is when the propeller, revolving at a racing speed, re-enters the water, the tremendous torsion strain is supplemented by the two horizontal blades coming down on what is practically a solid body. It is perhaps a wonder that they do not go oftener. When the Walters propeller re-enters the water, the weight of the boss helps it—much of the torque has been removed—and there is no flat part left on the blades to strike the surface of the water. The effect of steady running, the trials have shown, by the small amount of wear on the stern bush.

CONSOLIDATED LAKE SUPERIOR CO.

The reorganization of the Consolidated Lake Superior Co. has been declared operative by the Moffly reorganization committee, which promulgates the plan put forth Oct. 20, 1903. The new company will be known as the Lake Superior Co. and is capitalized at \$40,000,000 against \$86,000,000 of the old company. Under the plan which goes into effect on May 17, the \$40,000,000 of stock of the new company, all of one class, will be distributed, \$14,000,000 for the \$28,000,000 of preferred stock of the old company at the rate of two shares for one, and \$18,000,000 for the \$72,000,000 common stock of the old company at the rate of four shares for one of the new. As a bonus with the \$10,000,000 of first mortgage bonds, \$2,142,900 of stock will be given and the underwriters of the reorganization receive \$5,857,000 of stock. The underwriting is done by the Canadian Improvement Co. which furnished \$1,000,000 as cash working capital. The assets of the new company include this cash and all the property and raw material of the old company. Stockholders of the old company who have not yet assented to the plan are given until May 17 to do so upon the deposit of \$3 per share.

Capt. W. E. Pierce and E. B. Foss, formerly owners of the steamer Benton, have bought from the Michigan Wrecking & Salvage Co. of Detroit the steamer Ogemaw and will place her in commission between Bay City and Ontario lumber points in the lumber carrying trade. She will tow the barge Fillmore.

The Buffalo & Rochester Line, operating a fleet of four canal boats on the Erie canal, is hereafter to be known as the Whitney Grain Line. Charles Nicholson is agent at Buffalo.

WANTED and FOR SALE Department.

FOR SALE.

Buckets.

For Sale.—Two clam-shell buckets (standard makes) and a number of Long patent drop bottom coal buckets. Address Box 64, Marine Review, Cleveland tf

Tug for Sale.

Tug Frank Canfield, 75 ft. long. Engine 18 x 20, boiler 6½ x 13. Address Canfield Tug Line, Manistee, Mich. Apr. 28

Steamer for Sale at Cost, \$13,500.

The old Anchor Line twin-screw steamer Gordon Campbell. Two decks, gangways, hoisting machinery, etc. Suited to carrying coal, lumber, ties, package freight, etc. Spent \$3,500 in repairs this year. Other business requires my undivided attention and I will sell for cost to me. W. F. Carroll, 1011 Ashland block, Chicago. tf

Steam Launch.

For Sale.—Steam Launch, 50x10 ft.—full cabin, hardwood finish; license for 50 persons. Upright boilers, 28 H. P. Engine. All in good condition. Send for cut and description—J. C. Kimball, Jr., R. 219, 134 Washington St., Chicago Ill. May 12

Freight and Passenger Steamer.

For Sale.—Up-to-date, complete, speedy excursion freight and passenger steamer. Accommodate 400 to 500. Address Indiana Trans Co., 2 Rush St., Chicago. May 19

FOR SALE.

Yacht for Sale.

New beautiful 100-ft. steam yacht, fully equipped. Owner physically unable to use yacht. Will sell for any reasonable offer. Yacht can be seen in Detroit. Address M. J. Steffens, 57 East Twenty-second st., Chicago. tf

Two Steamers for Sale.

The Union Transit Co. in closing out its business offers the steamers John M. Nicol and Eber Ward for sale.

The steamer John M. Nicol is of the following dimensions: length 263 ft., beam 41 ft., depth 26 ft. Triple expansion engines with 900 indicated H. P. Steel boiler-house enclosing two Scotch boilers with steam pressure of 150 lbs. About \$30,000 laid out for repairs on this steamer in the past year.

Steamer Eber Ward.—Length 213 ft., beam 37 ft., depth 23 ft. Engines F. & A. compound with an indicated H. P. of 600. One Scotch boiler with steam pressure of 110 lbs.

For further information apply to H. C. French, 900 Ellicott Square, Buffalo, N. Y. May 12

Lighter For Sale Cheap.

Lighter three years old; three gunnels, 6 in. thick; three iron arches, full length inside; 92 ft. long; 24 ft. beam; 7 ft. deep amidships. Has fully 2 ft. rise at each end. Can be seen at Lorain, O. Inquire of J. J. Stang, Lorain, O. May 12

FOR SALE.

Steam Yacht for Sale.

Steam Yacht Vita.—Length 100 ft., beam 18 ft. Iron frame. Fully equipped. Can be seen at her anchorage at Detroit. Inquire of J. M. Kennedy, 915 Union Trust Bldg., Detroit, Mich. May 12

Steam Yacht Catherine.

For Sale.—Length 78 ft., beam 18 ft., triple expansion engines, water tube boiler, allowed 200 lbs.; electric light, search light, mahogany deck house 9 by 16, power launch, complete outfit, all in first-class condition. One of the best family cruising yachts on the Lakes. Inquire Wickes Bros., Saginaw, Mich. tf

Steamer C. W. Liken.

For Sale Cheap.—79 ft. long over all, 18 ft. beam. Engine 10 square. Rebuilt this winter. Would make good fish tug or small passenger tug. For further particulars address A. Wheeler, Bay City, Mich. May 19

WANTED.

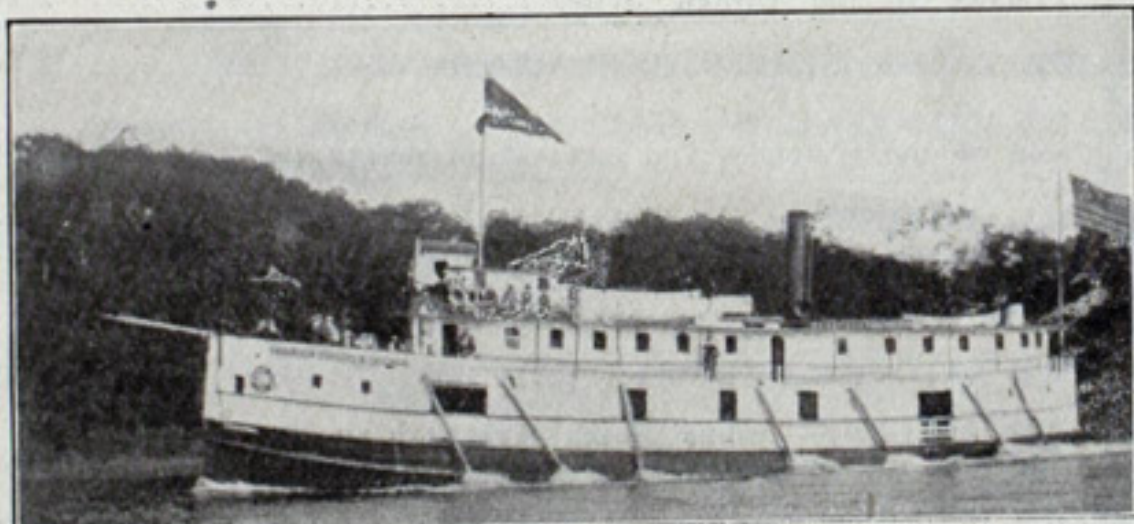
Mud Scows Wanted.

Wanted—Two mud scows, capacity one to two hundred cubic yards. State price and particulars. Address Box 65, Marine Review, Cleveland. May 26

Sealed proposals will be received at the office of the Lighthouse Engineer, Milwaukee, Wisconsin, until 3 o'clock p. m. June 1, 1904, and then opened, for a foundation crib and concrete pier with light tower and dwelling for Racine Reef, Lake Michigan, Wisconsin, in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to J. G. WARREN, Major, Corps of Engineers, U. S. A., Engineer. May 19

Chicago, Saugatuck & Douglas Trans. Co.

This boat line, two steamers, docks, etc., for sale.



Steamer Saugatuck—Length 125 ft., breadth 22 ft., depth 8 ft., 147 net tons. Licensed to carry 84 regular, 225 excursion passengers.

Steamer Chas. McVea—Length 135 ft., breadth 24 ft., depth 10 ft., 263 net tons. Licensed to carry 91 regular, 300 excursion passengers.

For full particulars apply to Griffin & Henry, Saugatuck, Mich. May 12

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Rail or Water Deliveries.

Seaboard Steel Casting Company,
Chester, Pa.



FOR SALE—This Fast Express, Seaworthy Propellor, (built 1902) wood hull, 4 water tight compartments, length 138 ft. by 28 ft. by 11 ft. 6 in., draught 8 ft. aft, 6 ft. forward; can carry 200 tons on 8 ft. maximum draught, F. and A. compound engines, cylinders 12 by 28 in. and 20 in. stroke. Has two Almy W. T. boilers of 450 H. P.; complete electric plant and searchlight. Bunker capacity 35 tons; consumes 5 tons in 24 hours. Speed, natural draft 13 miles, forced draft 14½ miles an hour. Allowed 400 day passengers. Price \$45,000. Address Wm. M. Talbott, 1531 N. Broadway, Baltimore, Md. May 5



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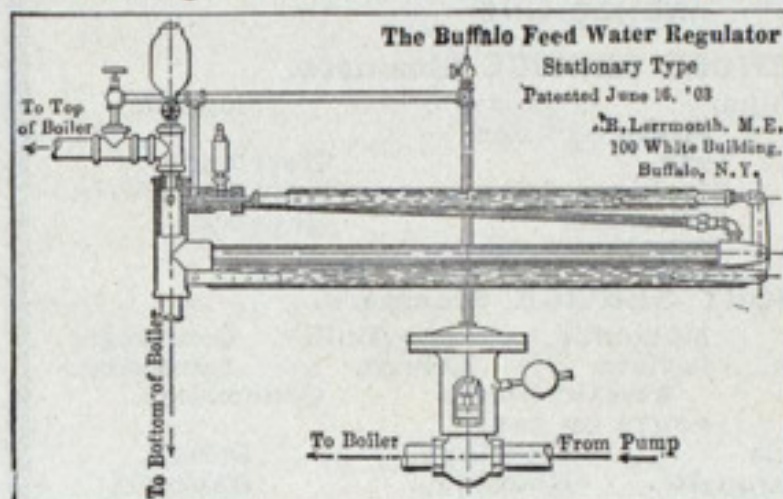
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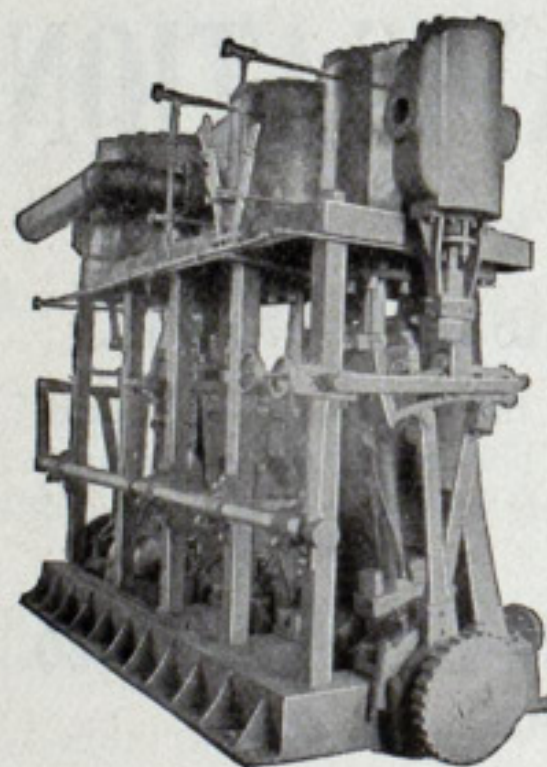
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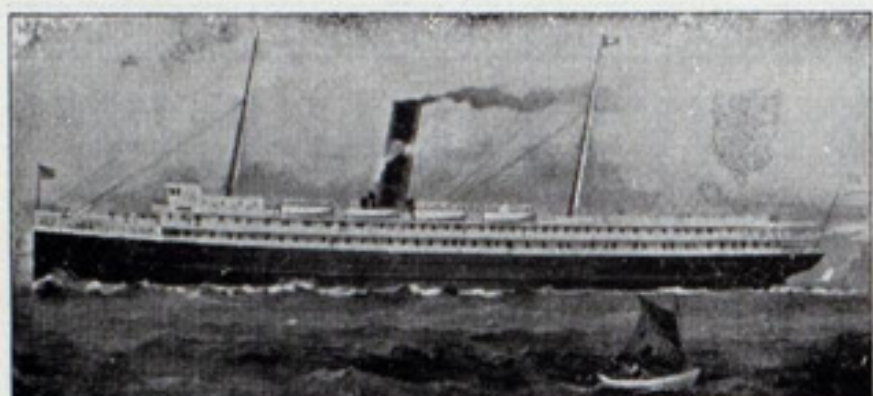
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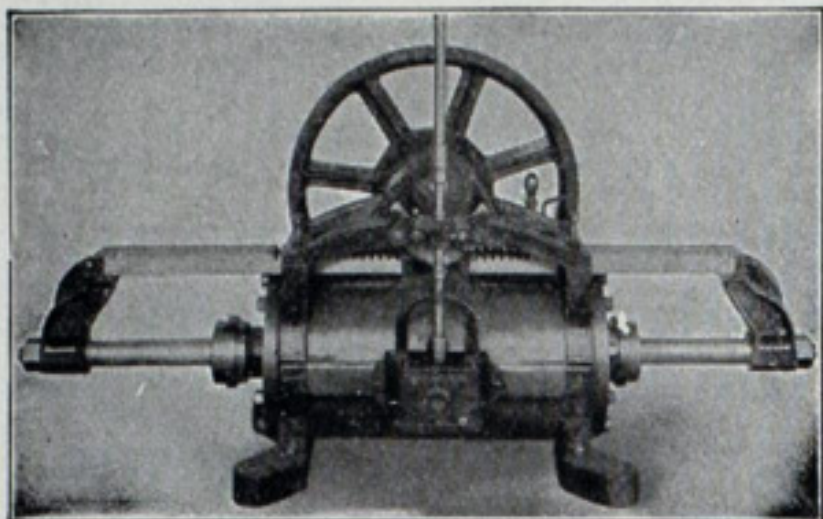
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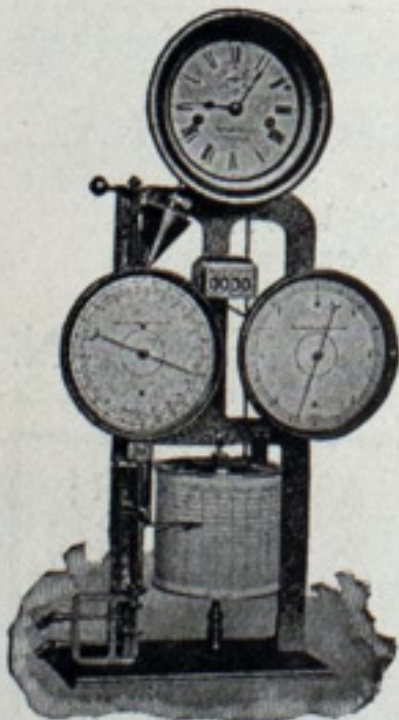
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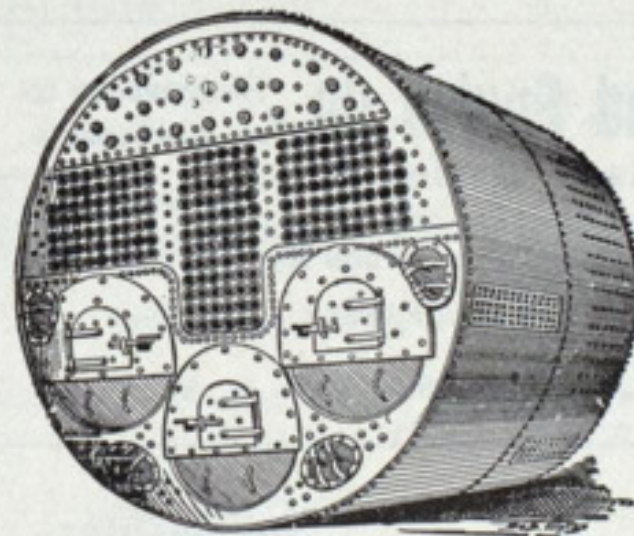
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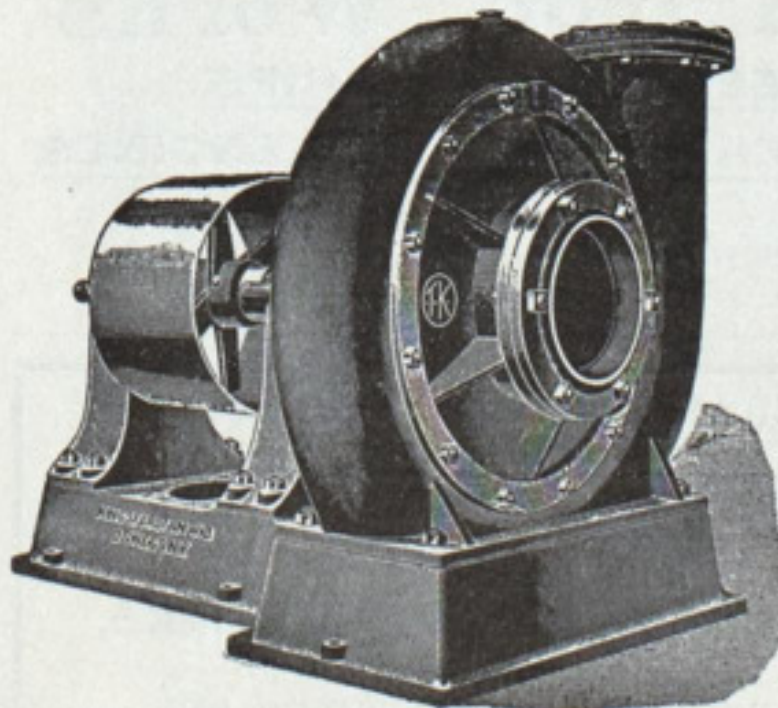
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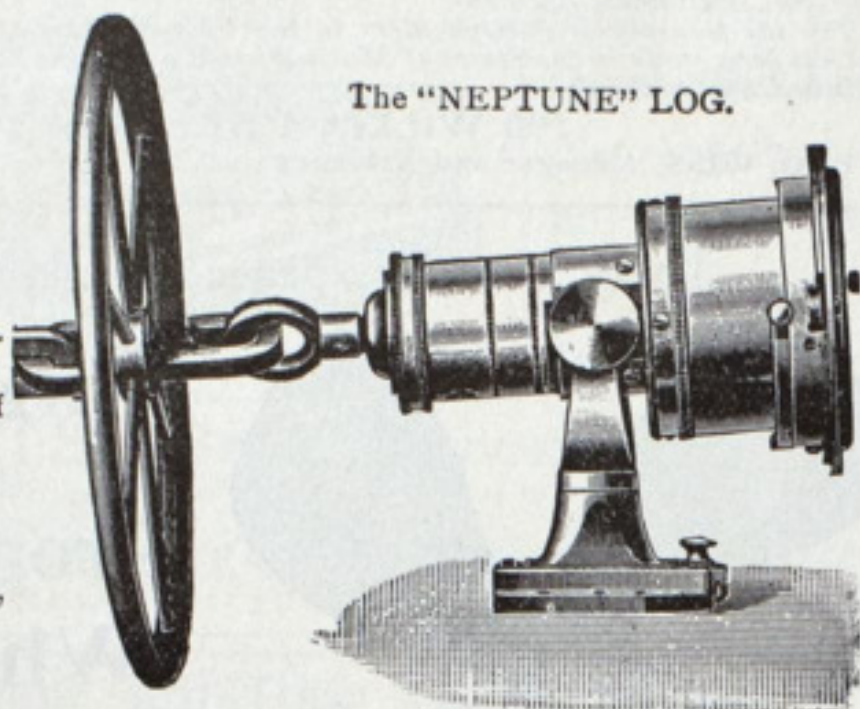
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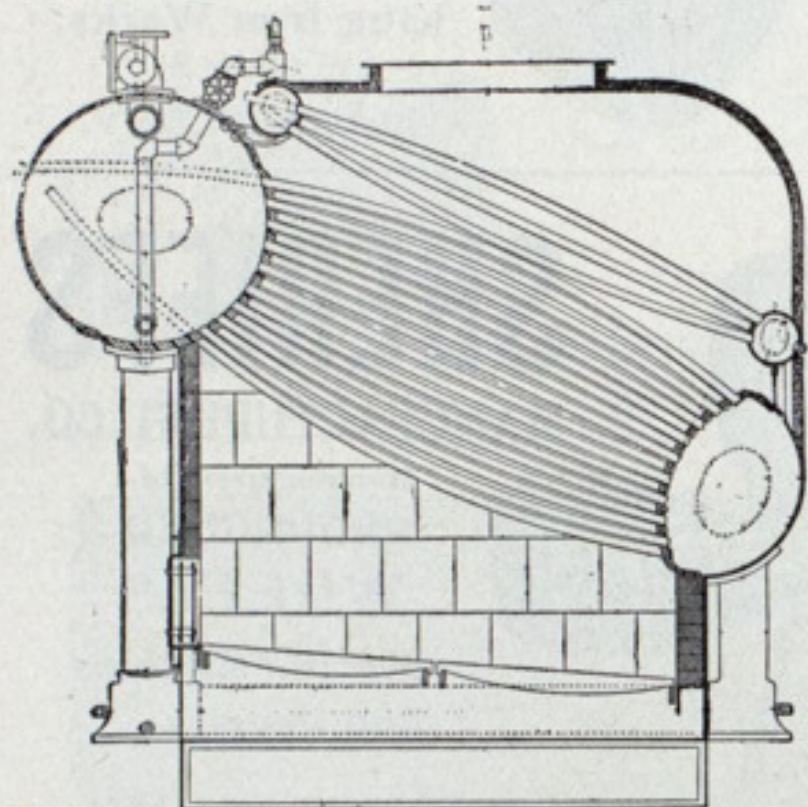
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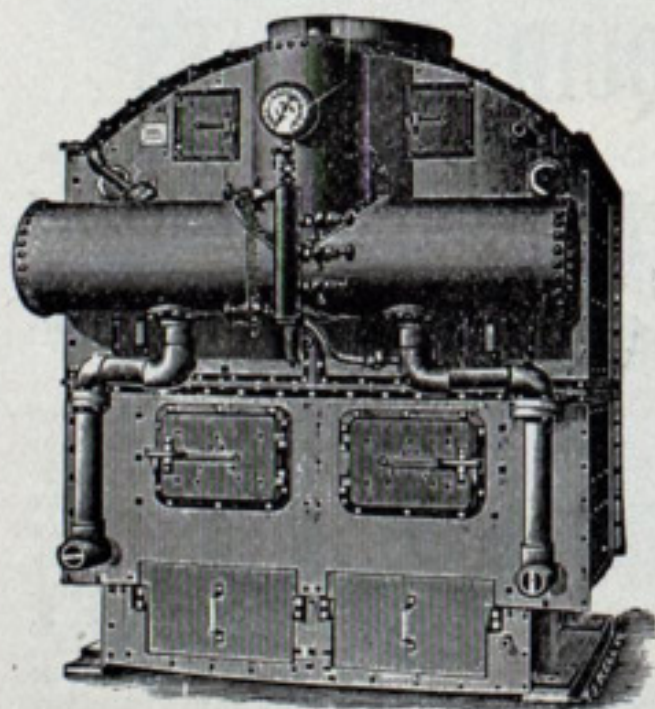


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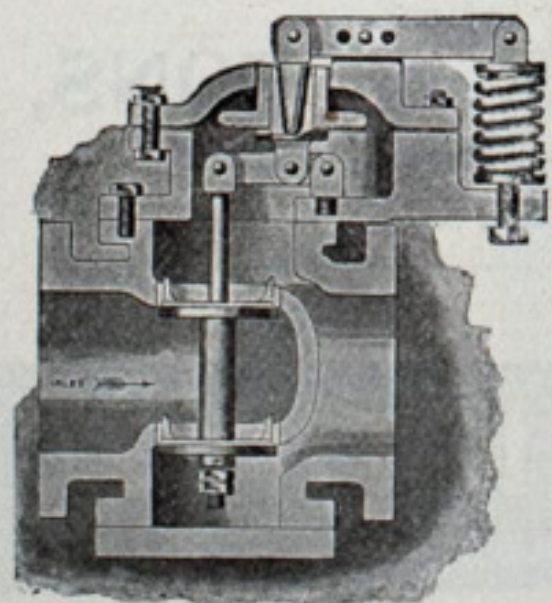
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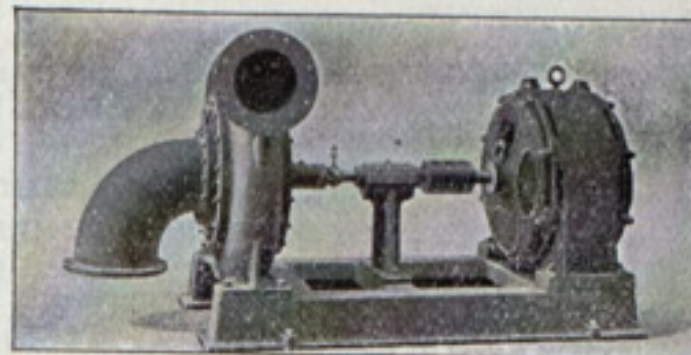
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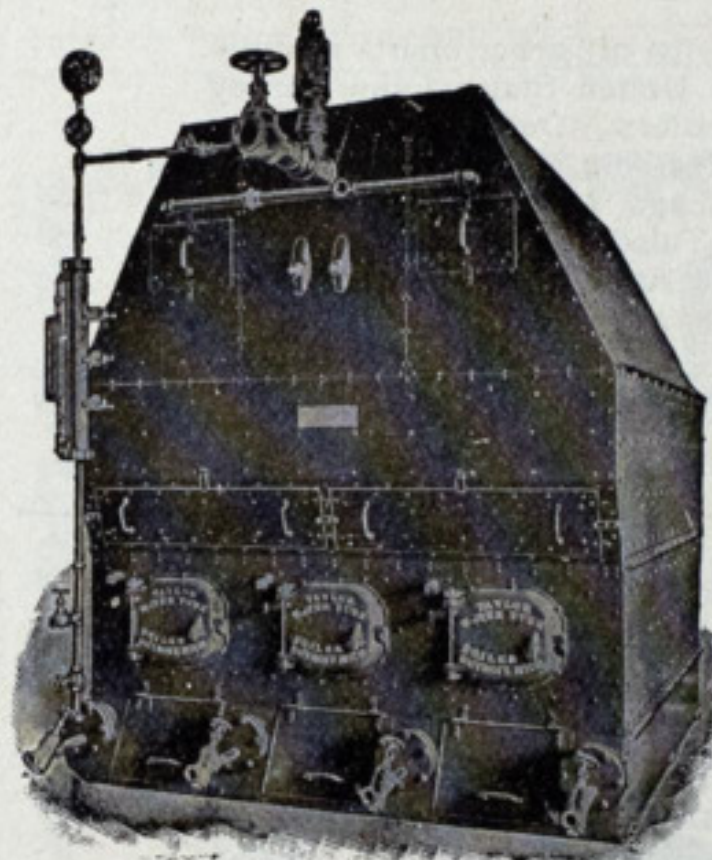
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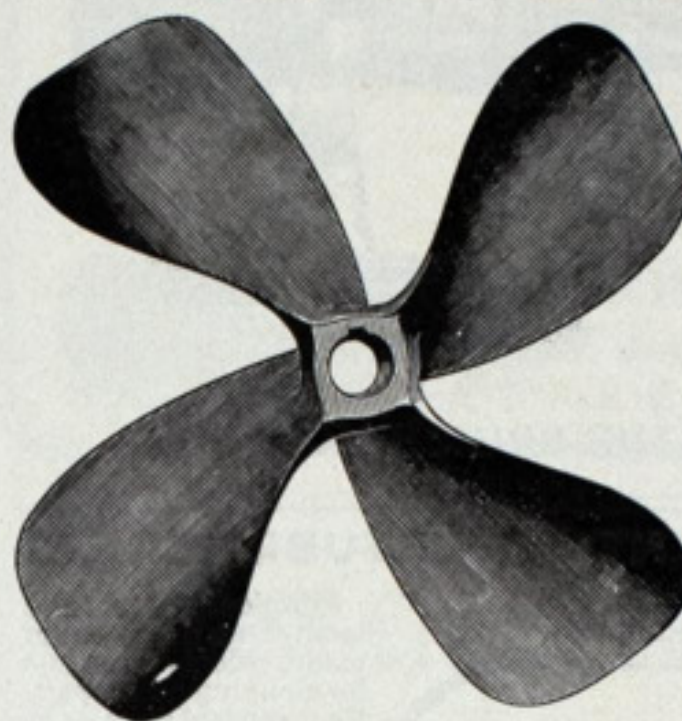
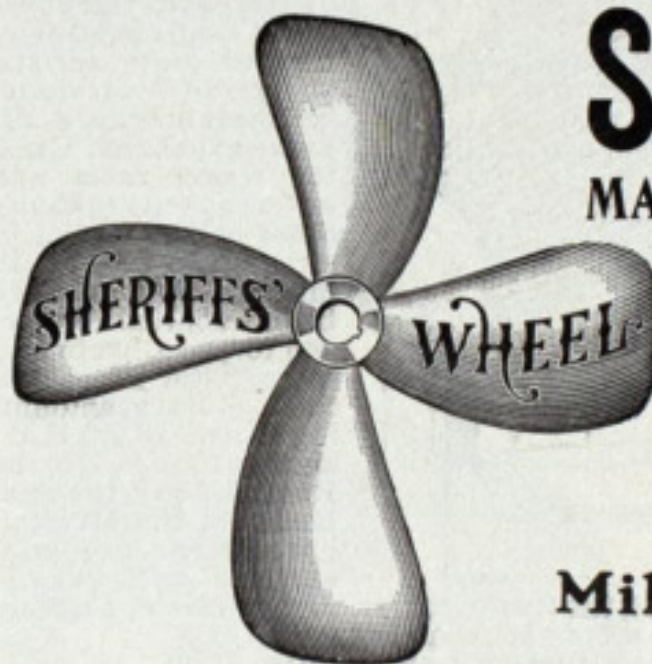
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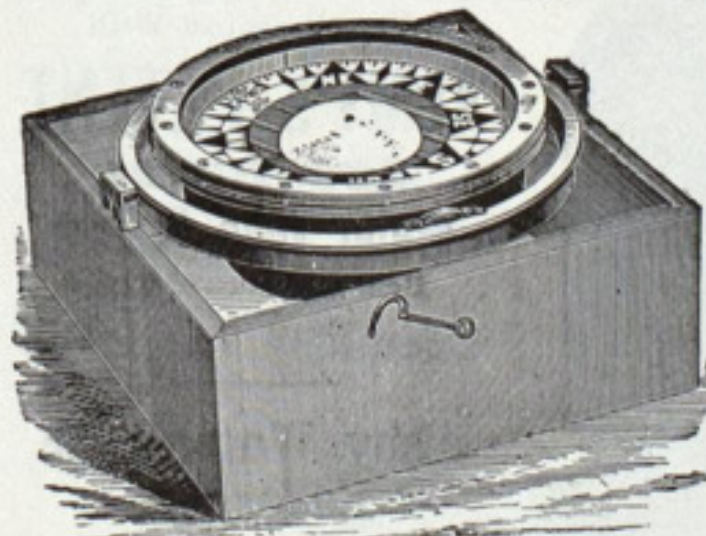
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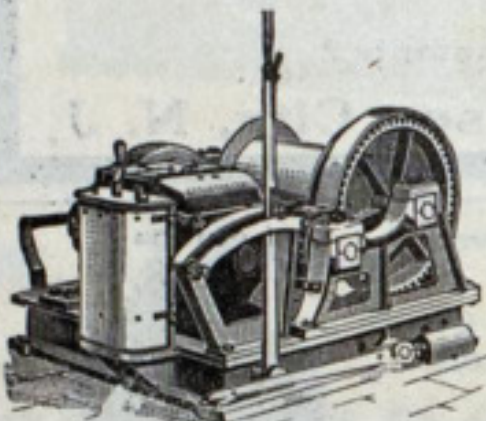
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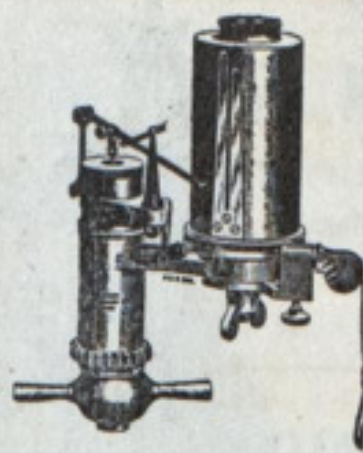
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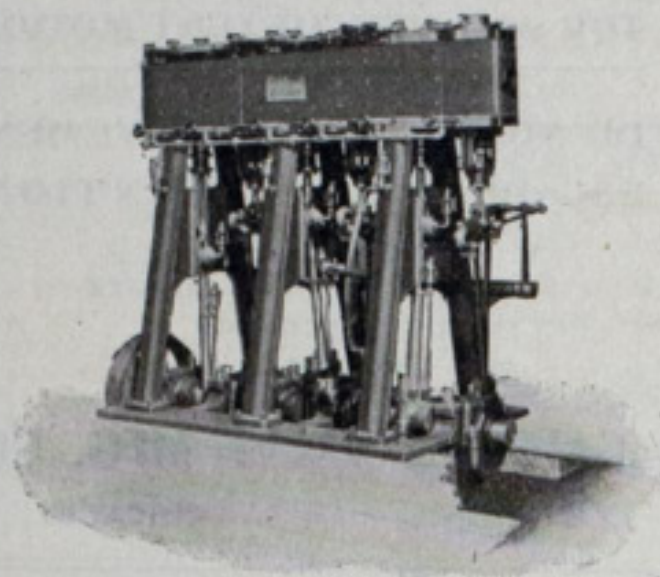
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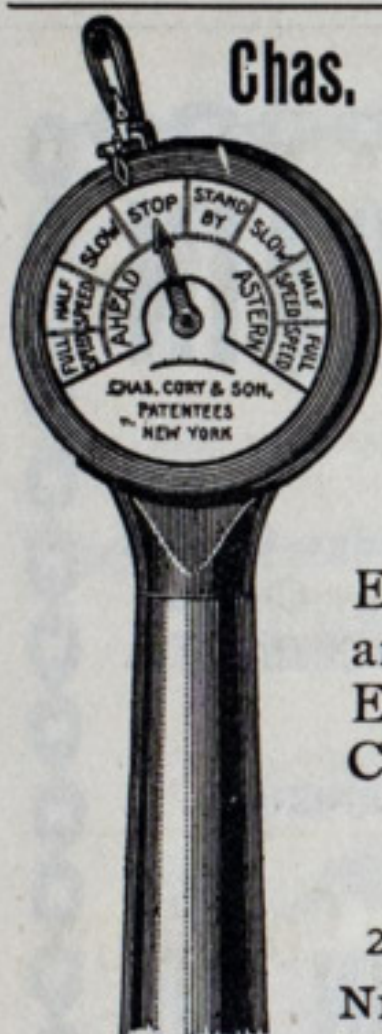


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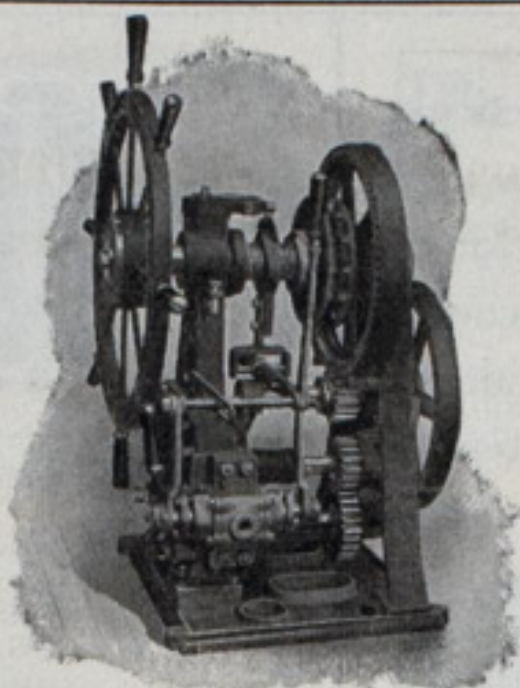
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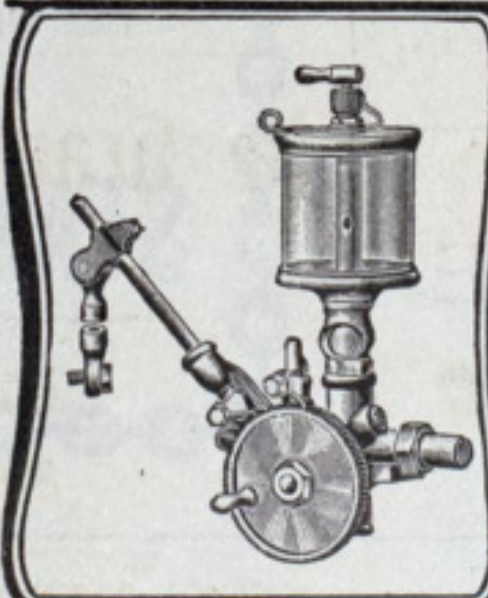
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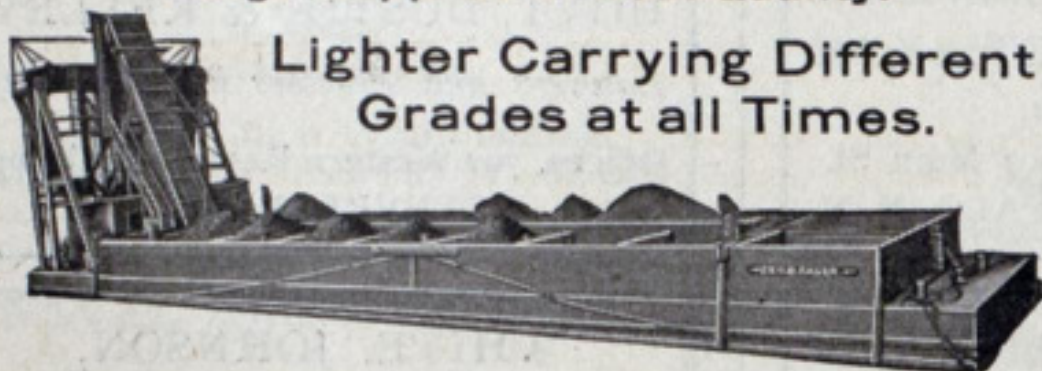
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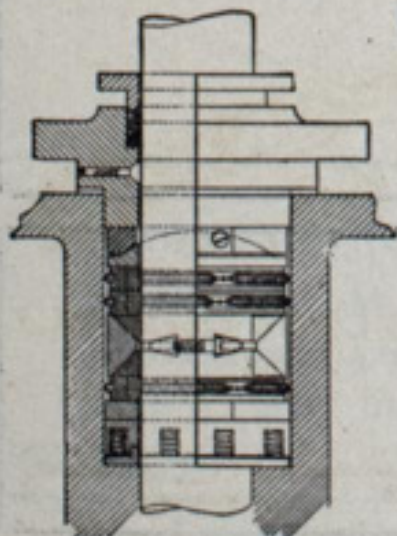
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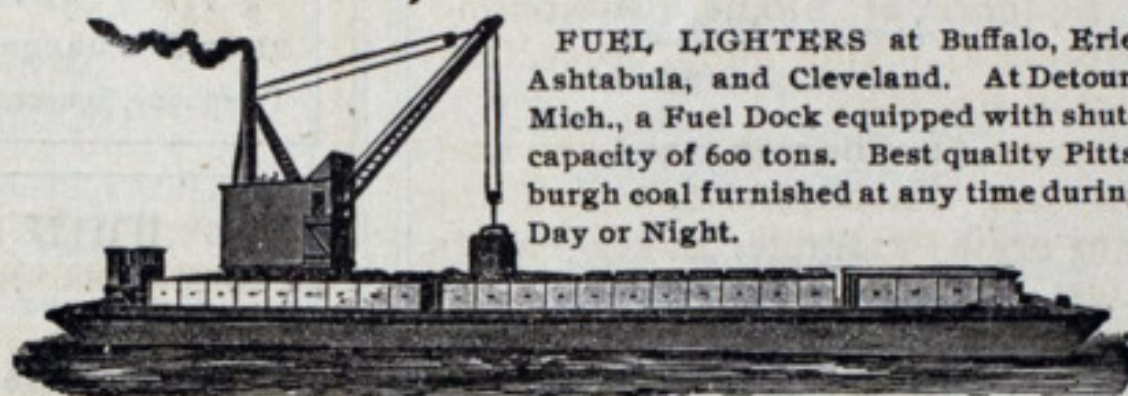
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CONTRACTORS, SUPPLIES.

Contractors Supply & Equipment Co.....Chicago.

CONTRACTORS FOR PUBLIC WORKS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Long Island City, N. Y.

COURSE FINDER.

Fields' Patent Course Finder.....Cleveland.

CHAIN CONVEYORS, HOISTS.

Brown Holsting Machinery Co (Inc.).....Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

CRANES, TRAVELING.

Brown Holsting Machinery Co.....Cleveland.
Lidgerwood Mfg. Co.....New York.
Pawling & Harnischfeger.....Milwaukee.

DISTANCE FINDER.

Nicholson Ship Log Co.....Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

DREDGING CONTRACTORS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

DRYING APPARATUS.

Bayley & Sons Co., Wm.....Milwaukee, Wis.
Sturtevant, B. F. Co.....Boston.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
United States Ship Building Co.....New York.

Buyers' Directory of the Marine Trade.—Continued.

ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.
 Lidgerwood Mfg. Co.....New York.
 Pawling & Harnischfeger.....Milwaukee.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

ELECTRIC LIGHT AND POWER PLANTS.

Bayley & Sons Co., Wm. Milwaukee, Wis.
 General Electric Co.....Schenectady, N. Y.
 Sturtevant, B. F. Co.....Boston.
 Thropp & Sons, John E. Trenton, N. J.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
 Atlantic Works.....East Boston, Mass.
 Chicago Ship Building Co.....Chicago.
 Chase Machine Co.....Cleveland.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Fletcher, W. & A. Co.....Hoboken, N. J.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works....Detroit, Mich.
 Hall Bros.....Philadelphia.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Mosher, Chas. D.....New York.
 Moulton Steering Engine Co.....New York.
 Newport News Ship Building Co.....Newport News, Va.
 Northwestern Steam Boiler & Mfg. Co.Duluth, Minn.
 Risdon Iron Works.....San Francisco.
 Roach's Ship Yard.....Chester, Pa.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Ship Building Co.....Superior, Wis.
 Thropp, J. E. & Sons Co.....Trenton, N. J.
 Trout, H. G.....Buffalo.
 United States Ship Building Co.....New York.
 Willard, Chas. P. & Co.....Chicago.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
 Marine Mfg. & Supply Co.....New York.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
 Kleley & Mueller.....New York.
 Lunkenheimer Co.....Cincinnati.
 Mooers & Co., H.....Milwaukee.
 New York Belting & Packing Co.....New York.
 Northwestern Steam Boiler & Mfg. Co.Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL,
CONSULTING.

Hynd, Alexander.....Cleveland.
 Hunt, Robt. W. & Co.....Chicago.
 Kidd, Joseph.....Duluth, Minn.
 Lovejoy, H. O.....Buffalo.
 Matteson & Drake.....Philadelphia.
 Mosher, Chas. D.....New York.
 Nacey, James.....Cleveland.
 Pittsburg Testing Laboratory, Ltd.....Pittsburg.
 Rice, Henry.....Buffalo.
 Roelker, H. B.....New York.
 Sadler, Perkins & Field.....New York.
 Steel, Adam.....Cleveland.
 Wood, W. J.....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Boston.

FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert.....Buffalo.
 Ross Valve Co.....Troy, N. Y.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

FORGES.

Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR
THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.....Cleveland.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Fix's, S. Sons.....Cleveland.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
 Ironville Dock & Coal Co.....Toledo, O.
 Parker Bros. Co., Ltd.....Detroit.
 Pickands, Mather & Co.....Cleveland.
 Pittsburg Coal Co.....Cleveland.
 Smith, Stanley B., & Co.....Detroit.
 Smith Coal & Dock Co., Stanley B.....Toledo, O.
 Youghiogheny & Lehigh Valley Coal Co....Chicago.

GASKETS, RUBBER.

New York Belting & Packing Co.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co.....New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.
 Georgian Bay Engineering Works....Midland, Ont.
 Temple Pump Co.....Chicago.

GAUGES, STEAM AND VACUUM.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.
 Lunkenheimer Co.....Cincinnati.
 Standard Gauge Mfg. Co.....Syracuse, N. Y.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
 Lunkenheimer Co.....Cincinnati, O.
 Standard Gauge Mfg. Co.....Syracuse, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Bayley & Sons Co., Wm. Milwaukee, Wis.
 Sturtevant, B. F. Co.....Boston.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
 Brown Hoisting Machinery Co. (Inc.)...Cleveland.
 Chase Machine Co.....Cleveland.
 Elwell-Parker Electric Co.....Cleveland.
 General Electric Co.....New York.
 Georgian Bay Engineering Works....Midland, Ont.
 Hyde Windlass Co.....Bath, Me.
 Lidgerwood Mfg. Co.....New York.
 Marine Iron Co.....Bay City.
 Pawling & Harnischfeger.....Milwaukee.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works....Detroit.
 Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
 Crane Co.....Chicago.
 Jenkins Bros.....New York.
 Lunkenheimer Co.....Cincinnati.
 Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
 Fleming & Co., P. H.....Chicago.
 Frankfort Marine, A. & P. G. Ins. Co....New York.
 Gilchrist & Co., C. P.....Cleveland.
 Hawgood & Co., W. A.....Cleveland.
 Helm & Co., D. T.....Duluth.
 Hutchinson & Co.....Cleveland.
 McCarthy, T. R.....Montreal.

INSURANCE, MARINE.—Continued.

McCurdy, Geo. L.....Chicago.
 Mitchell & Co.....Cleveland.
 Parker Bros. Co., Ltd.....Detroit.
 Peck, Chas. E. & W. F.....New York and Chicago.
 Prindiville & Co.....Chicago.
 Richardson, W. C.....Cleveland.
 Sullivan, D. & Co.....Chicago.
 Voss, F. D.....New York.
 Weeks, F. H.....New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland.
 Hanna, M. A. & Co.....Cleveland.
 Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works....Midland, Ont.
 Marine Construction & D. D. Co.....
Mariner's Harbor, S. I., N. Y.
 Truscott Boat Mfg. Co.....St. Joseph, Mich.
 Willard, Chas. P.....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co.....Pittsburg.
 Carley Life Float Co.....New York.
 Drein, Thos. & Son.....Wilmington, Del.
 Kahnweiler's Sons, D.....New York.
 Lane & DeGroot.....Long Island City, N. Y.
 Marine Construction & Dry Dock Co.....
Mariner's Harbor, S. I., N. Y.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
 Walker & Sons, Thomas.....Birmingham, Eng.
 Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
 Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.
 Shurick, F. S.....New York.

MACHINISTS.

Chase Machine Co.....Cleveland.
 Gogebic Steam Boiler Works....Duluth, Minn.
 Hickler Bros.....Sault Ste. Marie, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Mooers & Co., H.....Milwaukee.
 Union Machine & Boiler Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.
 Meckes John.....Cleveland.
 Siegel Cooper Co.....New York.
 Sterling & Welch Co.....Cleveland.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
 Detroit Ship Building Co.....Detroit.
 Great Lakes Engineering Works....Detroit.
 Sturtevant, B. F. Co.....Boston.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.
 U. S. Metallic Packing Co.....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Bayley & Sons Co., Wm. Milwaukee, Wis.
 Sturtevant, B. F. Co.....Boston.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Ritchie, E. S. & Sons.....Brookline, Mass.

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NAVAL ARCHITECTS.

Hynd, Alexander Cleveland.
 Kidd, Joseph Duluth, Minn.
 Lovejoy, H. O. Buffalo.
 Matteson & Drake Philadelphia.
 Mosher, Chas. D. New York.
 Nacey, James Cleveland.
 Rice, Henry Buffalo.
 Sadler, Perkins & Field.....New York.
 Steel, Adam Cleveland.
 Wood, W. J. Chicago.

OAKUM.

DeGrauw, Aymar & Co.....New York.
 Stratford Oakum Co Jersey City, N. J.

OIL FOR PAINTING.

Sipe & Co., James B. Allegheny, Pa.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
 Standard Oil Co.....Cleveland.

PACKING.

American Steam Packing Co.....Boston.
 Crane Co. Chicago.
 Jenkins Bros. New York.
 Katzenstein, L. & Co.....New York.
 New York Belting & Packing Co.....New York.
 United States Metallic Packing Co....Philadelphia.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
 Detroit Varnish Co.....Detroit.
 Detroit White Lead Works.....Detroit.
 Forest City Paint and Varnish Co Cleveland.
 New Jersey Zinc Co.....New York.
 Sipe & Co., James B. Allegheny, Pa.
 Upson-Walton Co. Cleveland.

PATENT ATTORNEYS.

Thurston & Bates Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co Buffalo.
 Chicago & Gt. Lakes Dredge & Dock Co...Chicago.
 Dunbar & Sullivan Dredging Co.....Buffalo.
 Fitz-Simon & Connell Co.....Chicago.
 Hickler Bros. Sault Ste. Marie, Mich.
 Parker Bros. Co., Ltd. Detroit.
 Smith Co., L. P. & J. A. Cleveland.
 Starke Dredge & Dock Co., C. H. Milwaukee.

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland.
 Crane Co. Chicago.
 Macbeth Iron Co. Cleveland.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co. Cleveland.
 Otis Steel Co. Cleveland.

PNEUMATIC TOOLS.

Allen, John F. New York.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

PRESSURE REGULATORS.

Kieley & Mueller New York.
 Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
 Atlantic Works East Boston, Mass.
 Cramp, Wm. & Sons.....Philadelphia.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 Phosphor Bronze Smelting Co., Ltd.....Philadelphia.
 Risdon Iron Works San Francisco.
 Roelker, H. B. New York.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Shipbuilding Co.....Superior, Wis.
 Thropp & Sons Co., J. E.....Trenton, N. J.
 Trout, H. G. Buffalo.
 United States Ship Building Co.....New York.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
 Great Lakes Engineering Works.....Detroit.
 Kingsford Foundry & Machine Wks..Oswego, N. Y.
 Temple Pump Co.....Chicago.

PUNCHES, RIVETERS, SHEARS.

Allen, John F. New York.

RANGES.

Russell & Watson Buffalo.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B. New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register Cleveland.
 Record of American & Foreign Shipping..New York.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
 Georgian Bay Engineering Works Midland, Ont.
 Gogebic Steam Boiler Works.....Duluth, Minn.
 Marine Iron Co.....Duluth, Minn.
 Forest City Boiler Co.....Cleveland.

RIVETING MACHINES.

Allen, John F. New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland.

SAFETY VALVES.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.
 Crane Co. Chicago.
 Hayden Mfg. Co., N. L. Columbus, O.
 Lunkenheimer Co. Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
 Upson-Walton Co.....Cleveland.
 Wilson & Silsby Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland.
 Otis Steel Co. Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
 Atlantic Works East Boston, Mass.
 Buffalo Dry Dock Co.....Buffalo.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Chicago Ship Building Co.....Chicago.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Manitowoc Dry Dock Co.....Manitowoc, Wis.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 Risdon Iron Works San Francisco.
 Roach's Ship Yard.....Chester, Pa.
 Shipowner's Dry Dock Co.....Chicago.
 Smith & Son, Abram Algonac, Mich.
 United States Ship Building Co.....New York.
 Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
 Marine Mfg. & Supply Co.....New York.
 Upson-Walton Co.....Cleveland.

SHIP LANTERNS AND LAMPS.

Russell & Watson Buffalo.

SHIP TIMBER.

Martin-Barriss Co. Cleveland.
 Shurick, F. S. New York.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR, SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
 Gilchrist & Co., C. P. Cleveland.
 Holmes, Samuel New York.
 McCarthy, T. R. Montreal, Can.
 Weeks, F. H. New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
 Anchor Line.....Buffalo.
 Erie & Western Trans Co.....Buffalo.
 International Mercantile Marine Co....Philadelphia.
 Manitou Steamship Co.....Chicago.
 Red Star Line New York.
 United Fruit Co.....Boston.

STEEL CASTINGS.

Macbeth Iron Co.....Cleveland.
 Otis Steel Co.....Cleveland.
 Seaboard Steel Casting Co.....Chester, Pa.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
 Chase Machine Co.....Cleveland.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Marine Mfg. & Supply Co.....Cleveland.
 Moulton Steering Engine Co.....New York.
 Pawling & Harnischfeger Milwaukee.
 Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J. Boston.
 Schrader's Son, A. New York.

SURVEYORS, MARINE.

Gaskin, Edward Buffalo.
 Hynd, Alexander Cleveland.
 Lovejoy, H. O. Buffalo.
 Matteson & Drake Philadelphia.
 Parker Bros. Co., Ltd. Detroit.
 Nacey, James Cleveland.
 Rice, Henry Buffalo.
 Steel, Adam Cleveland.
 Wood, W. J. Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
 Pittsburg Testing Laboratory Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. New York.
 Watson-Stillman Co. New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
 Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
 Great Lakes Towing Co.....Cleveland.
 Midland Towing & Wrecking Co., Ltd..Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller New York.
 Lunkenheimer Co.....Cincinnati.
 Sturtevant Co., B. F., Jamaica Plain.....Boston.

TRUCKS.

Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co.....Pittsburg, Pa.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co.	Boston.
Ashton Valve Co	Boston.
Crane Co.	Chicago.
Jenkins Bros.	New York.
Kieley & Mueller	New York.
Lunkenheimer Co.	Cincinnati.
Ross Valve Co.	Troy, N. Y.

VALVES FOR WATER AND GAS.

Ross Valve Co.....Troy, N. Y.

VARNISHES.

Detroit Varnish Co Detroit.
 Detroit White Lead Works.....Detroit.
 Forest City Paint & Varnish Co., ...Cleveland
 New Jersey Zinc Co.....New York.
 Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Bayley & Sons Co., Wm..... Milwaukee, Wis.
Sturtevant, B. F. Co.....Boston.

VESSEL AND FREIGHT AGENTS.

Boland, John J.	Buffalo.
Brown & Co.	Buffalo.
Elwell, Jas. W. & Co.	New York.
Elphicke, C. W. & Co.	Chicago.
Fleming & Co., P. H.	Chicago.
Gilchrist & Co., C. P.	Cleveland.
Hall & Root	Buffalo.
Helm & Co., D. T.	Duluth.
Hawgood & Co., W. A.	Cleveland.
Holmes, Samuel	New York.
Hutchinson & Co.	Cleveland.
McCarthy, T. R.	Montreal.
Mitchell & Co.	Cleveland.
Parker Bros. Co., Ltd.	Detroit.
Prindiville & Co.	Chicago.
Richardson, W. C.	Cleveland.
Sullivan, D. & Co.	Chicago.
Weeks, F. H.	New York.

WATER GAUGES.

Bonner & Co., Wm. T.....Boston
Lunkenheimer Co.....Cincinnati, O.

VESSEL FURNISHINGS.

Meckes, John	Cleveland
Siegel Cooper Co.....	New York.
Sterling & Welch Co.....	Cleveland.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....	Buffalo.
DeGrauw, Aymar & Co.....	New York.
Upson-Walton Co.	Cleveland.

WHISTLES, STEAM.

American Steam Gauge Co.....	Boston.
Ashton Valve Co.....	Boston.
Lunkenhelmer Co.	Cincinnati.

WINDLASSES.

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Marine Mfg. & Supply Co.....New York

WINCHES.

American Ship Windlass Co.....Providence, R. I.
Georgian Bay Engineering Works.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co., Kingston, Ont.
Great Lakes Towing Co., Cleveland.
Midland Towing & Wrecking Co., Ltd., Midland, Ont.
Parker Bros. Co., Ltd., Detroit.

YACHT AND BOAT BUILDERS.

Drain, Thos. & Son.....Wilmington, Del.
Georgian Bay Engineering Works . . . Midland, Ont.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co....New York.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co.....Chicago.

YAWLS.

Dreln, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.

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*Craig Ship Building Co.....	11
Cramp, Wm. & Sons, S. & E. B. Co.	41
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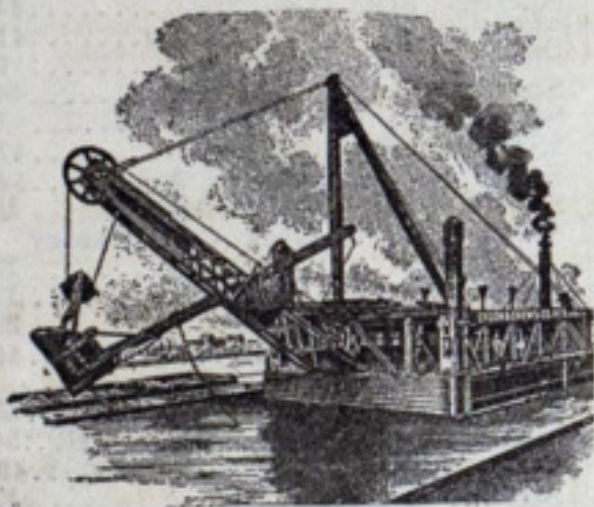
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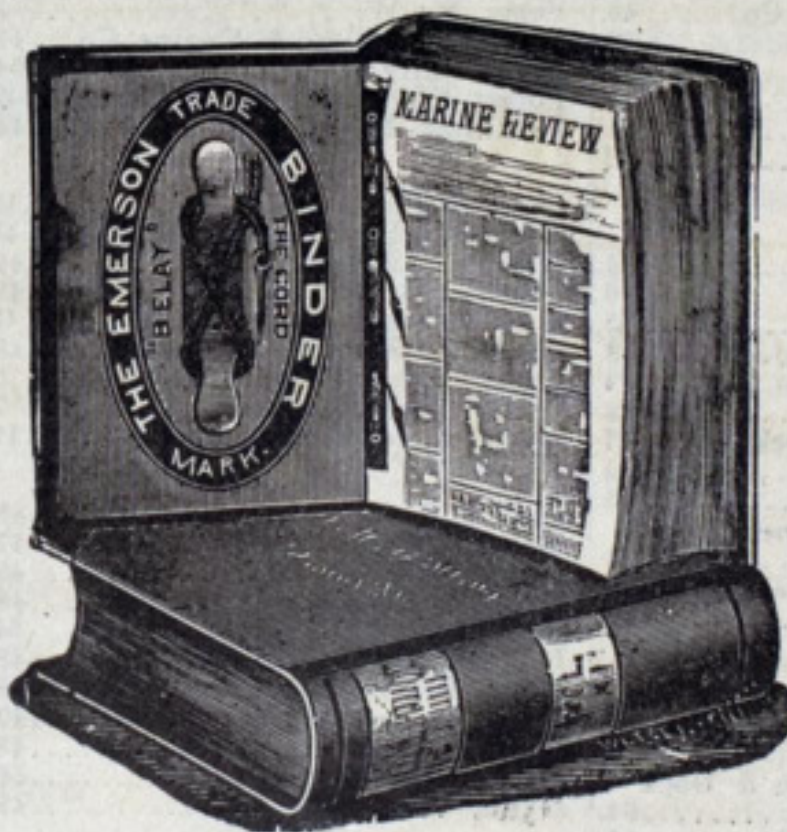
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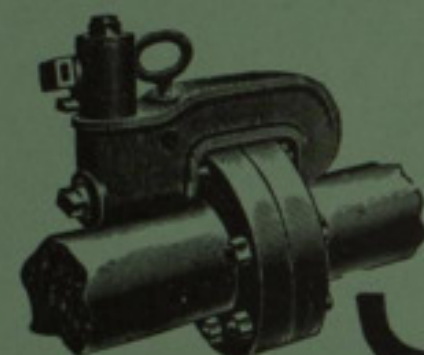
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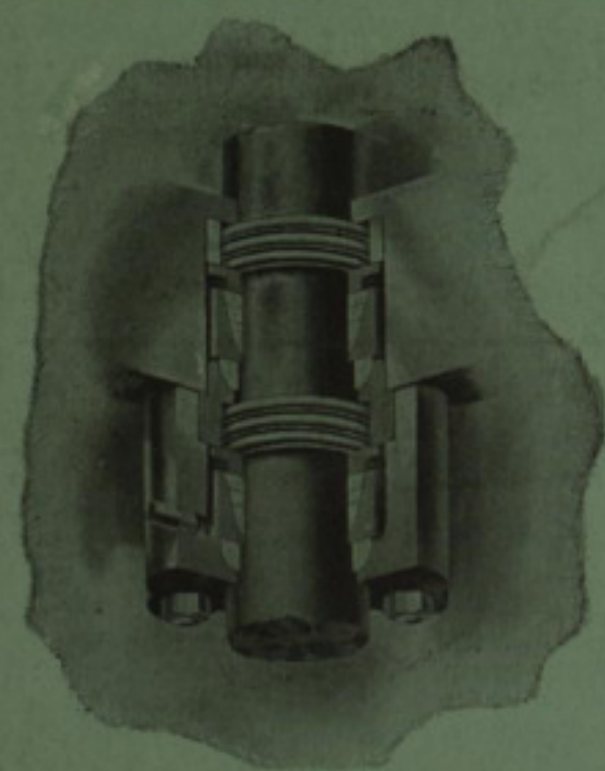
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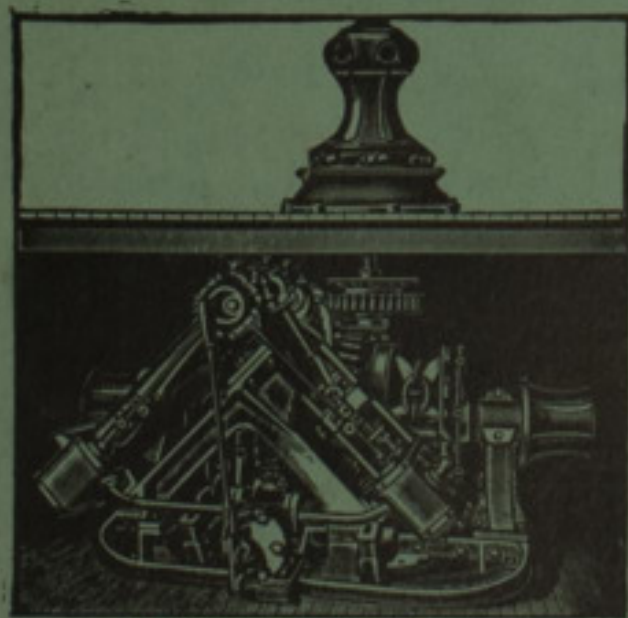
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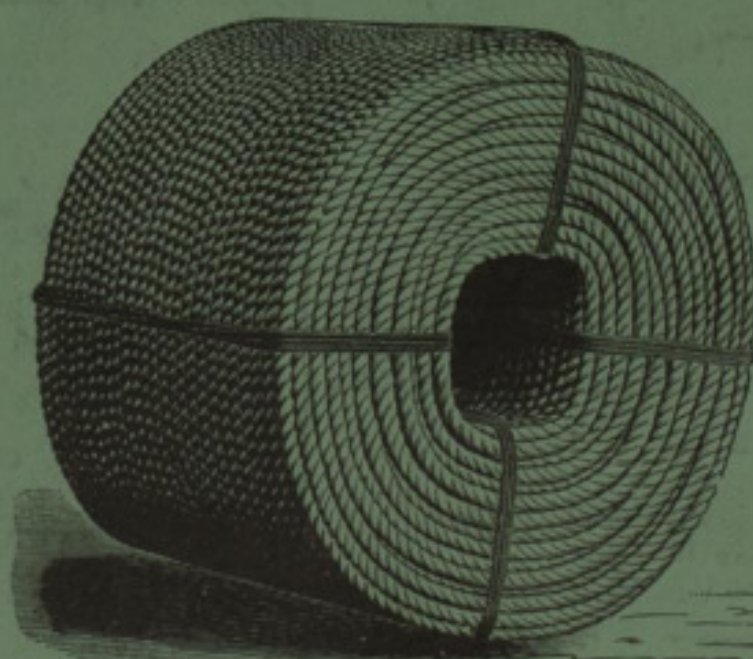
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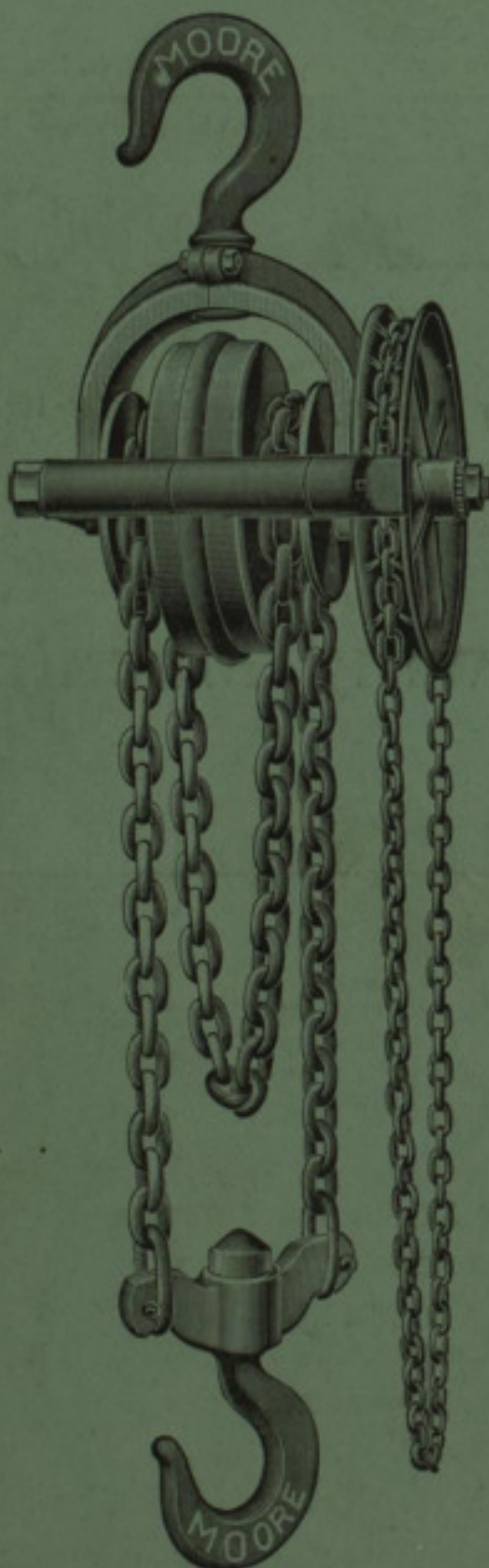


Fig. 100.
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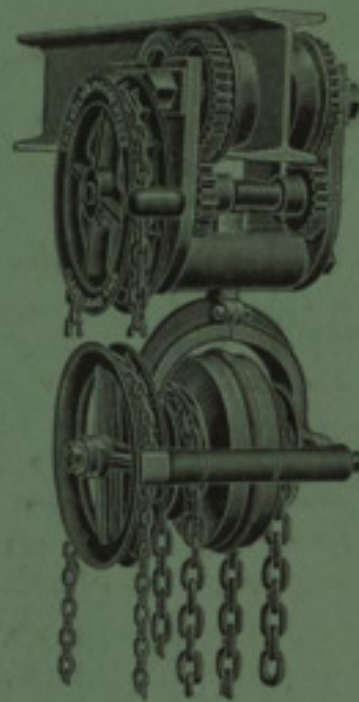


Fig. 111.



Fig. 114.



Fig. 200.
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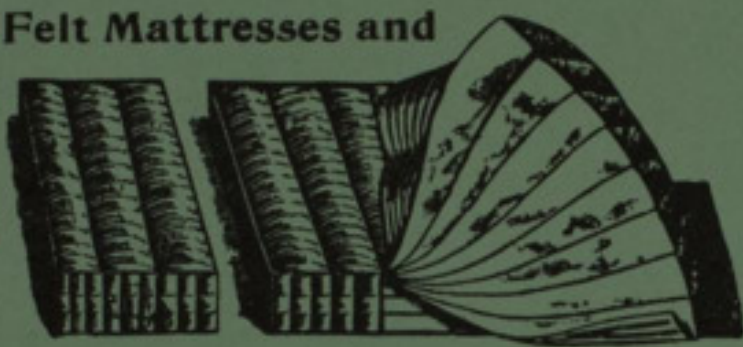
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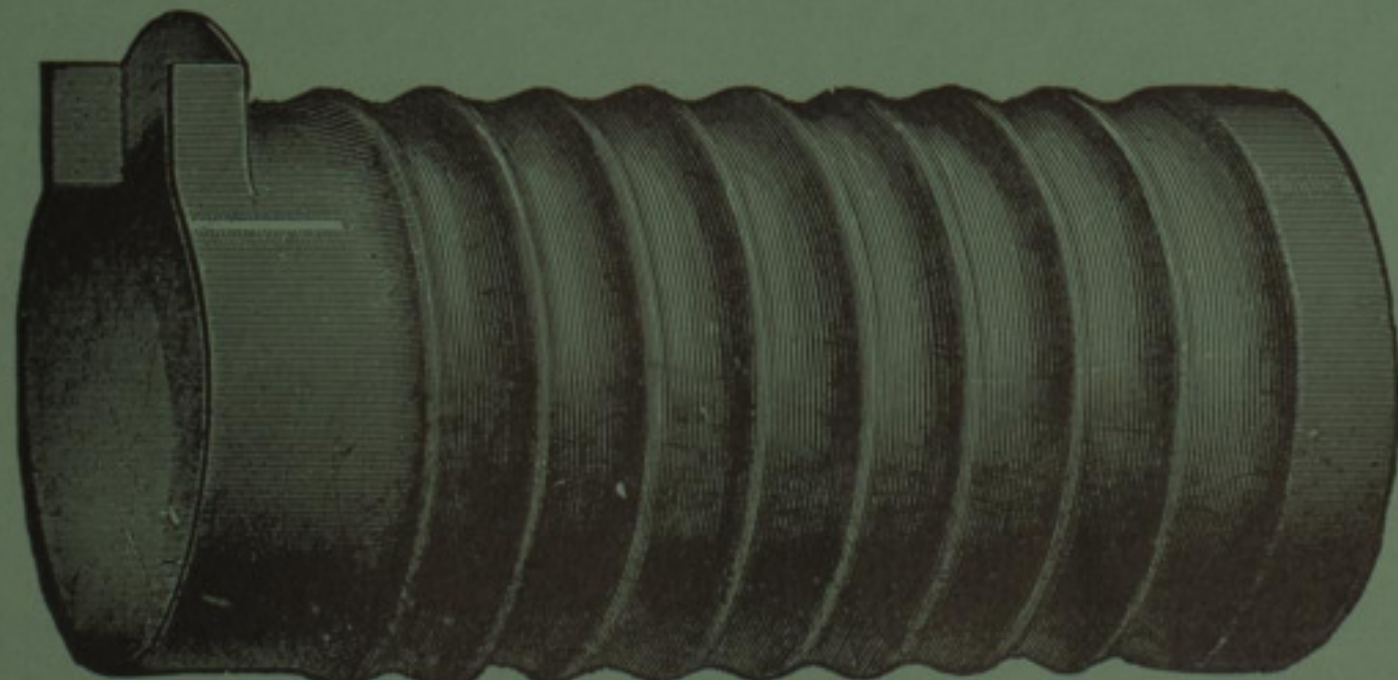
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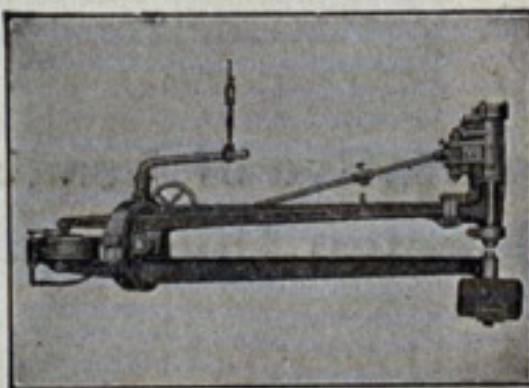
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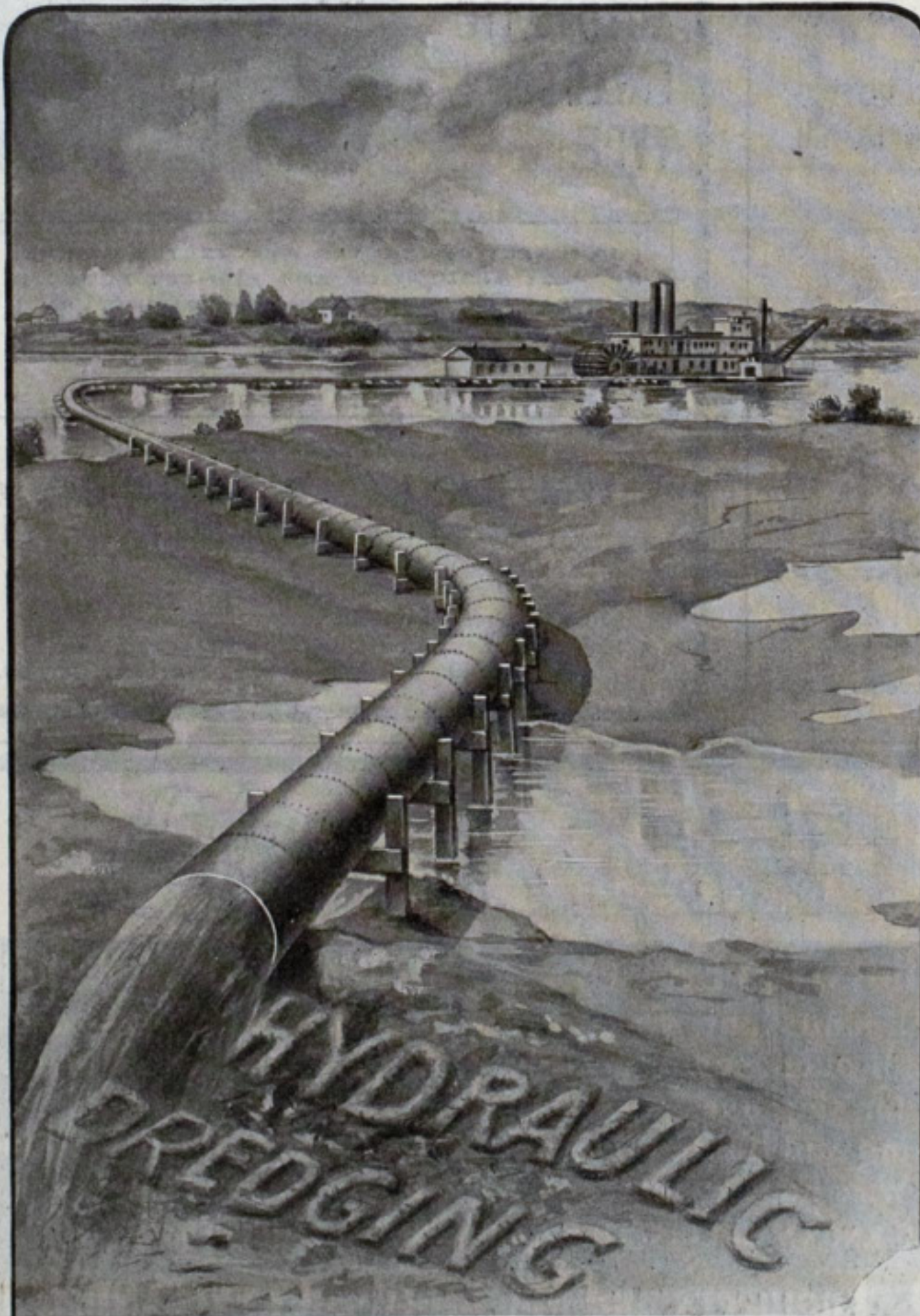
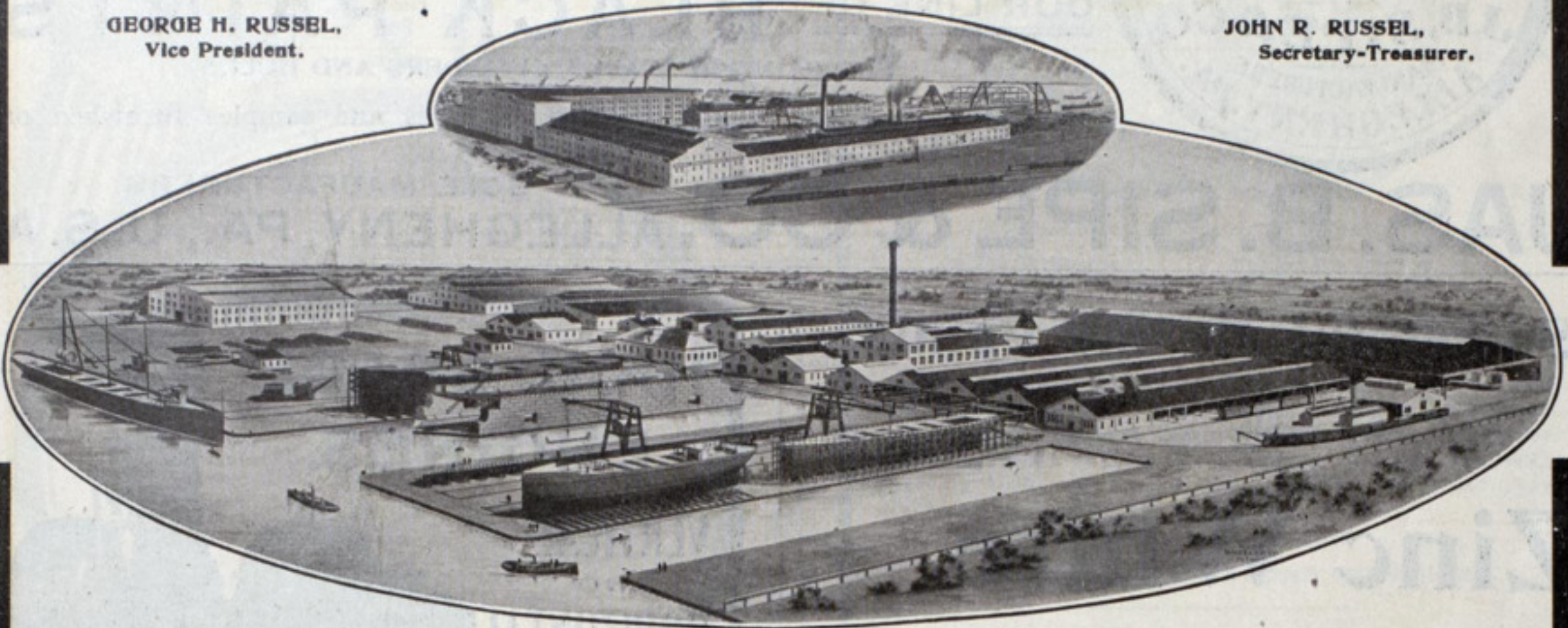
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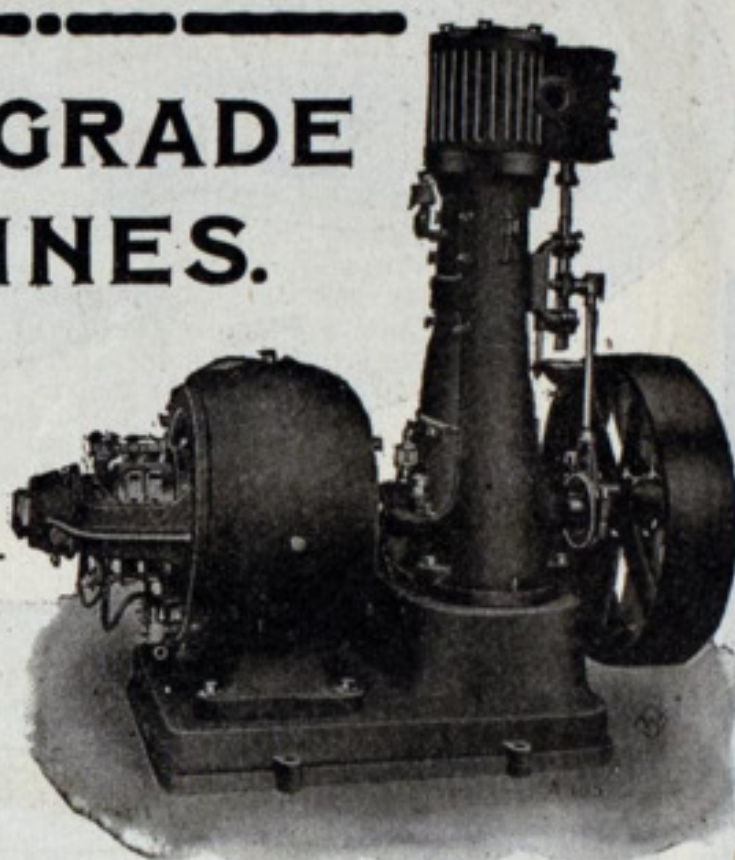
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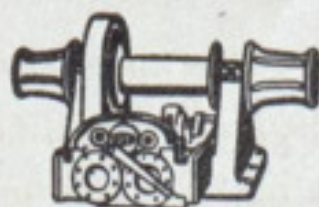
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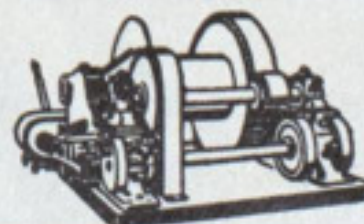
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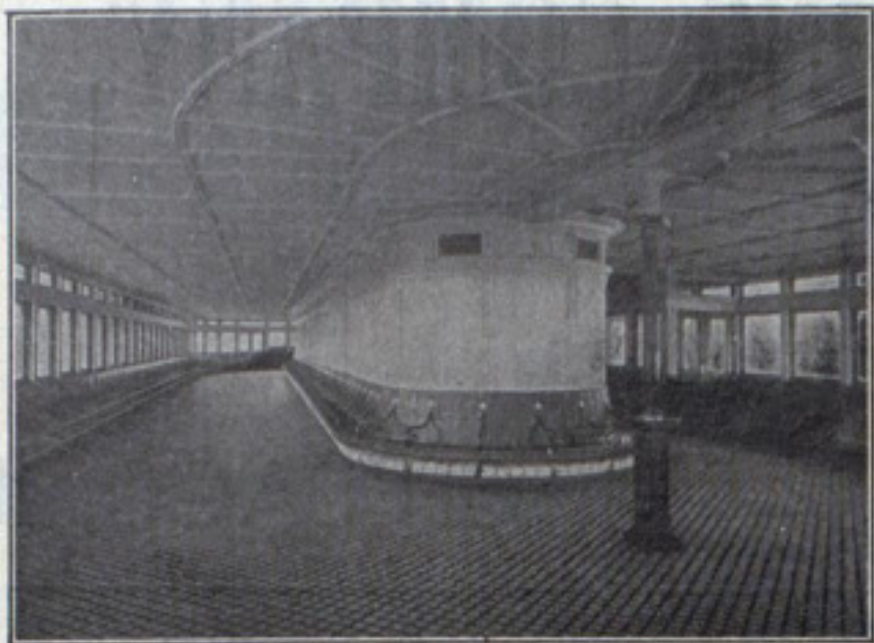
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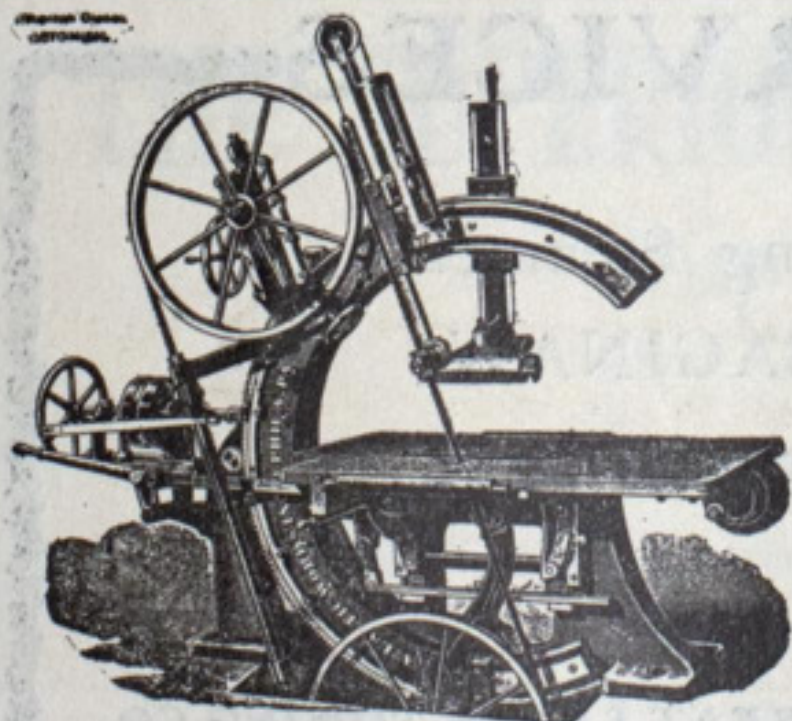
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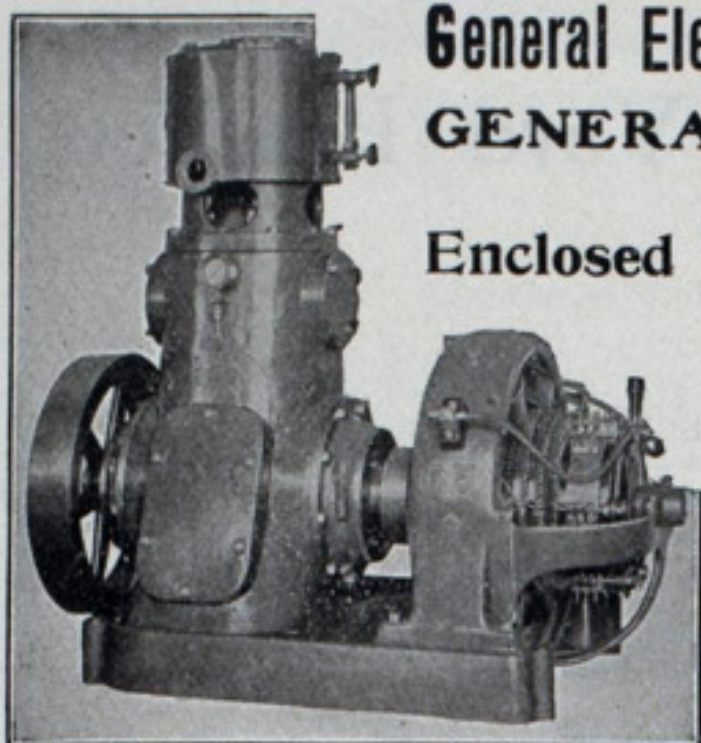
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